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Choice of Post-Secondary Studies in a Stratified System of Education

A Swedish Follow-Up
Study

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CHOICE OF POST-SECONDARY STUDIES IN A STRATIFIED SYSTEM OF EDUCATION

A Swedish Follow-Up Study

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ABSTRACT

The present investigation examines factors associated with choice of post-secondary studies among a national sample of Swedish gymnasium graduates. It is based on follow-up data for graduates who participated in the survey conducted in 1970 by the International Association for the Evaluation of Educational Achievement (IEA). The analyses focus on the decision to continue to higher education or not, to enroll in one type of university program instead of another, and to choose a non-university program instead of a traditional university one. Some models that have been advanced to explain differences in educational choice are discussed. Special attention is paid to the structural aspects of choice and the mechanisms of selection and self-selection. Factors in the analytical model include socio-economic background, parental encouragement, program followed in secondary school, past educational performance as well as level of ambition and intrinsic learning interest. The relative importance of these factors for choice of studies is examined by Multiple Classification Analysis (MCA).

INTERNATIONAL ASSOCIATION FOR THE EVALUATION OF EDUCATIONAL ACHIEVEMENT (IEA)

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Paris
March 1980

ABSTRACT

The present investigation examines factors associated with choice of post-secondary studies among a national sample of Swedish gymnasium graduates. It is based on follow-up data for graduates who participated in the survey conducted in 1970 by the International Association for the Evaluation of Educational Achievement (IEA). The analyses focus on the decision to continue to higher education or not, to enroll in one type of university program instead of another, and to choose a non-university program instead of a traditional university one. Some models that have been advanced to explain differences in educational choice are discussed. Special attention is paid to the structural aspects of choice and the mechanisms of selection and self-selection. Factors in the analytical model include socioeconomic background, parental encouragement, program followed in secondary school, past educational performance as well as level of ambition and intrinsic learning interest. The relative importance of these factors for choice of studies is examined by Multiple Classification Analysis (MCA). In the analysis of determinants of enrollment in higher education in general, past educational performance (Grades) and Program consistently showed high predictive power. In introducing the last two variables, particularly Program, it was found that the association between SES and enrollment disappeared among the male students, whereas its influence remained significant among females. The importance of the attitudinal variables, Ambition and Intrinsic Learning Interest manifested itself particularly in the choice of post-secondary program. Graduates who chose the least vocationally oriented alternative, i.e., studies in the Arts and Science faculties, also showed the highest intrinsic learning interest. Furthermore, the higher the level of ambition, the greater the likelihood that the student chose a more prestigious study alternative.

Descriptors:

Higher education, Post-secondary education, Educational choice, Recruitment, Selection.

CHAPTER 1

BACKGROUND AND AIMS OF THE STUDY

The purpose of the present study is to shed light on the choice of and the selection to post-secondary education in Sweden during the early 1970's. The study constitutes an extension of the so called PUB Project, a follow-up investigation of the upper secondary school (gymnasium) graduates who participated in the survey conducted by the International Association for the Evaluation of Educational Achievement (IEA) in 1970[1]. The PUB Project originally aimed at giving a descriptive picture of the educational choices made by the subjects during the first years after graduation from the gymnasium, and the relationship of their choices to previous scholastic attainments, attitudes and social background factors. Findings from this part of the project have already been reported in Mählck (1974) and Mählck and Mattsson (1975). A special analysis concerning recruitment to higher education in the fields of science and technology has been made by Mählck (1975).

During the final stage of the project a shift took place away from the problem "Who goes to higher education?" towards a closer consideration of the process of stratification in the educational system, both at the secondary and post-secondary level. This also entailed a shift in perspective from an individual-centered analysis to one where more attention was paid to selection mechanisms and the structure of choices facing the individual. This constitutes the focus of the present study which reports attempts post hoc to accomodate previously collected data and also results from subsequent empirical analyses, within a new conceptual model of analysis. We shall trace the origin of the present study by describing briefly some developments in Swedish higher education during the 1950's and 1960's.

Great hopes were attached to the far-reaching educational reforms which were carried out in Sweden during the decades after the second world war and which were intended to contribute to a more equitable society. Judging from the increased number of young people, not least women, from less privileged social strata who went on to higher education in the mid- to late 1960's, these hopes seemed justified. However, some critical voices maintained that the increased enrollment did not represent a true equalization, since the value of further education was no longer the same as before the introduction of mass higher education (Gesser, 1971). But in comparison with some other countries at the same level of development the results achieved so far seemed

encouraging (Anderson, 1975). However, the high enrollment figures, especially in the nonprofession-oriented courses, began to worry policy makers. This led to the establishment, in 1968, of the so-called U68 Commission which was to investigate the relationship between the needs on the labor market for university-trained people and the individual demand for higher education from the mid-70's to the early 80's. On the basis of its findings, the Commission was also to propose a plan for the re-organization of post-secondary education as a whole.

The year after this Commission had begun its work, however, the trend towards increased enrollment in higher education was reversed. We are here referring to attendance by gymnasium graduates who traditionally constitute the pool of potential university entrants. It should be noted in passing that during the same period there was also a spectacular rise in the number of adults (that is, those over 25 years of age) enrolling for shorter or longer courses at the university level. These two apparently opposite tendencies - the demand for further studies among those already in working life, and the more reticent attitude among the young gymnasium graduates - combined to focus attention once again on classical recruitment issues, such as who the actual entrants were, and in what respects they differed from those who did not enter post-secondary studies.

Problems such as these constituted the starting point for the PUB Project. The origin of the project could also be traced to the fact that valuable information on the achievement, attitudes, home background, etc., of Swedish gymnasium graduates was already available from the IEA survey.[2] Furthermore, the IEA sample was nationally representative and comprized a fairly large number of students. However, since the IEA survey mainly dealt with determinants of achievement in various school subjects, some specific information related to students' educational and professional career was missing. Obviously, these conditions have affected the planning of the present study. Given the limitations of the data gathered, it was decided to conduct three separate analyses based on the following choices:

1. To continue to higher education or not.
2. To enroll in one type of university program instead of another.
3. To enroll in a non-university program instead of traditional university studies.

The fact that the analyses of the recruitment to higher education are concentrated on the more or less elaborate divisions within the group of "on-goers", whereas other secondary school graduates are treated merely as "non-goers", does not imply any value judgment as to the desirability or rationality of directly entering the labor market or starting some shorter form of training at a "lower" level than the traditional university education. This approach is entirely due to the limitations inherent in the study, given that there is no concrete information available concerning the type of training or work this grop of students chose or whether they went on to higher education at a later date, after several years in working life. Primary school teacher training constitutes the only non-university program on which enrollment data were available.

A special feature of the strategy of analysis adopted is that it focusses on comparisons between students who, at the actual time of decision-making, had similar or identical opportunities for choice. In other words, one of the aims of the study is to throw some light on the self-selection which takes place at different levels. Our model includes social background, parental encouragement, level of ambition, intrinsic learning interest, program followed, and academic performance in secondary school. The relative importance of the factors included can be expected to vary with type of choice. Likewise, the patterns of choice can be expected to differ between males and females.

The present report consists of the following chapters:

Chapter 2 provides a short description of Swedish higher education and the roads leading to it. Special attention is given to the notions of selection and self-selection and to the different functions of higher education as well. The second part of Chapter 2 reviews previous Swedish empirical research on recruitment to higher education, especially from a methodological point of view.

An elaborate description of how the analytical model of the study has evolved is given in Chapter 3.

Chapter 4 describes the collection of data, the variables used in the study as well as the composition of the sample of gymnasium graduates whose subsequent educational choice is the subject of analyses in the remaining chapters.

Chapter 5 deals with the students' decision to enroll (or not to enroll) in higher education.

Chapter 6 focusses on the stratification in higher education and examines students' choice of programs whose prestige and career perspectives differ. The choice between studies in law or economics/business administration versus humanities and social sciences is analyzed in the first part of the Chapter. Why some students enroll in science programs at the university when they are qualified for studies at Institutes of Technology is another problem that is analyzed in Chapter 6. The last part of the Chapter highlights teacher training, a post-secondary course increasingly favored by gymnasium graduates at the expense of traditional non-vocational liberal-arts oriented university courses.

Chapter 7, finally, summarizes and discusses the findings of the study.

Notes

1. "PUB", in Swedish, stands for "Student Background and Choice of Post-secondary Education".

   The investigation was financed by the Research and Development Unit of the Swedish National Board of Universities and Colleges. Professor Torsten Husén supervised the project and the present author carried out the survey. The investigation was conducted at the Institute of International Education, University of Stockholm.

2. Under the auspices of the International Association for the Evaluation of Educational Achievement(IEA), the level of knowledge among students at the primary and secondary level was tested in over 20 countries during 1970/71. The subjects covered by the survey were Science (Biology, Chemistry, Physics), Literature, Reading Comprehension, English and French as foreign languages, and Civic Education (Husén et al., 1973; Peaker, 1975; and Walker, 1976).

CHAPTER 2

SELECTION TO HIGHER EDUCATION - DEFINITIONS, CONCEPTS, and REVIEW OF RESEARCH

> "There is no single point at which young people decide upon one out of all possible careers, but there are many crossroads at which their lives take decisive turns which narrow the range of future alternatives and influence the ultimate choice of an occupation."
>
> (Blau et al., 1956, p. 532)

2.1 The System of Higher Education in Sweden

The present study concentrates on choice of higher education among students who have completed upper secondary school in Sweden (gymnasium). The decisions made at this stage are likely to have an important impact on the subsequent careers of the individuals concerned. However, this is certainly not the only critical point and perhaps not the most important one either. The students have to pass several hurdles on their way to higher education and the choice process is characteristically highly institutionalized. In Sweden, as in many other European countries, selection to higher education is of a cumulative nature. The essential stages in this selection are summarized below:

Choice/selection	Level	Age
Choice of optional courses/ subjects in order to be eligible for entrance examination to 3-year gymnasium tracks preparing for higher education	Grades 7-9 in the compulsory school	14-16
Entry into tracks preparing for higher education	Gymnasium, 1st year	16
Staying on in tracks preparing for higher education or not (working life or transfer to vocational tracks)	Gymnasium, 1-3 years	16-19
Entry to higher education	After completion of final year of gymnasium	19

Before 1977, the notion of higher education in Sweden was confined to those post-secondary courses which required for admission a completed three or four-year program in the gymnasium. Another difference between higher education and other types of post-secondary education concerned the length of the courses. Graduation from an institution of higher education required at least three years of study. This implied that not only the traditional universities but also specialized colleges and schools, such as the College of Social Work and Public Administration and the Institutes of Technology, were considered higher education institutions. The Central Bureau of Statistics (SCB) also included in this category some institutions which formally did not require more than completed compulsory education, but whose students in general were gymnasium graduates (see Chapter 5). To facilitate comparison between the present study and other Swedish studies, the practice of the SCB will be followed. To avoid repetition, the term "university and university colleges" will be used interchangeably with "higher education".

It should be noted that the expression "higher education" covers a very heterogeneous set of institutions and programs. In the first place, an open admission policy was in force for one part of the system of higher education in Sweden, the so-called "open admission faculties" (Humanities, Social Sciences, Science, Law, and Theology). In other faculties or branches the students competed on the basis of grades obtained in their final year of the gymnasium. Admission to some of the institutions was highly restricted, especially in medicine, veterinary science, dentistry, etc., whereas the competition was less pronounced in the case of the College of Social Work and Public Administration and certain courses at the Institutes of Technology. Secondly, admission to certain branches of higher education required certain qualifications in specific subjects, for instance in mathematics and science at the upper secondary level.

Our outline above of the selection at different levels of the system is incomplete in the sense that selection also occurs after entry to higher education in the form of transfers from one course to another, drop-out, recruitment for doctoral studies, and so on. Furthermore, it does not take into account the efforts made by the authorities over the last 10-15 years to make the system more flexible by promoting what is known as "recurrent education".

In Sweden, the universities and colleges have, with some exceptions (e.g., the Stockholm School of Economics and Business Administration and the College of Journalism), no direct influence on the recruitment of

students to the courses which they dispense. The admission to programs with restricted intake is regulated by the Central Admittance Agency of the National Board of Universities and Colleges. Before the reform of 1977, selection was in most cases based solely on the students' grades (grade-point-average) during the final year of upper secondary school. A consequence of the completely centralized selection procedure is that potential candidates and their parents can easily get a clear picture of the number of applicants and grades required at different institutions throughout the country, not only during the semester preceding application, but also during previous years. (The ranking of institutions in terms of grades required tends to be fairly stable over several years.) This information is published periodically by the Central Admittance Agency and is reproduced by most newspapers in the country.

As was mentioned above, admission to the non-restricted programs, which are all organized at the universities, was practically automatic for students who had completed a three- or four-year program at the upper secondary school. The student had simply to register at the faculty and then at the university department before attending the first classes.(1)

2.2 Selection and Self-selection

We have used the term "selection" to describe the operations undertaken by the educational institutions and the choice made by the students. It is necessary to try to clarify these notions and to examine the way the system and the individuals interact. Häyrynen (1970) has presented a classification scheme of the processes regulating the distribution of individuals to different occupational functions. This scheme, which is also applicable to the selection processes characterizing the educational system, may be a useful starting point for our discussion. Häyrynen (1970) makes a distinction between the following processes:

> "1) spontaneous self-selection: career decisions by which individuals tend to realize their personal goals and values;
>
> 2) institutional selection: the direct procedures by which an institution selects individuals for various posts;
>
> 3) institutionally-regulated self-selection: guidance, information and other procedures by which an institution affects self-distribution in order to achieve a desired distribution;
>
> 4) macro-level distribution policy: policies by which society regulates the flow of individuals within the educational or occupational system, e.g., planning of open channels for education, establishment of voca-

tional guidance system."
(Op.cit., p. 9)

Apparently "spontaneous self-selection" is synonymous with individual choice. The relationships between the processes mentioned in Häyrynen's classification are complex and need further clarification. One way of doing this would be to look into the goals that direct the actions of the different agents. Before proceeding to the different goals involved, we shall look at the selection process from a slightly different angle.

In his overview of selections to and within higher education in France, Lévy-Garboua (1977) makes a distinction between pré-orientation (a combination of guidance and allocation of students into different streams at the secondary level), pré-sélection (at the entrance to faculties with restricted intake), and sélection (after entry into a particular program in higher education). According to Lévy-Garboua, it is common to associate the word "selection" with student failure and elimination. In other words, it is a question of forcing certain students not considered suited for further studies in the subject or the course as a whole to revise their first choice of study and possibly even of profession. However, in reality the so-called "sélection contraignante" is only the visible part of a process which contains a second part, auto- or self-selection. These two parts are reciprocal and interdependent.

Another French researcher, Mingat (1977), used the parallel of determination of prices in a market survey to explain student entry into different types of higher education. In the case of education it seems reasonable to assume that in the short-term, supply is rigid and that the corresponding demand on the part of the students reflects their adaptation to this situation, and their attempt to find the best possible alternative given their personal characteristics and preferences.

The term "self-selection" could also be given a normative connotation. The implication is that an individual or a group of students abandon the possibility of an educational or occupational alternative for which they may be qualified and choose a "lower" alternative, i.e., an alternative which leads to less prestigious or well-paid professions and to which persons less formally qualified are equally admitted.

It is a more or less official doctrine in Sweden, as in most other countries, that selection for further-going schooling beyond the compulsory level should be based on intellectual capacity alone. In a review of the

international situation, Husén (1975) showed that in practically all societies there is a rather high correlation between intellectual ability, as measured by intelligence test scores, and level of educational attainment. However, he also demonstrated a consistent, although weaker association between educational attainment and socio-economic background.

Selection based on a deliberate policy on the part of the educational authorities is sometimes referred to as "intentional" (Gesser, 1968; Cerych & Smith, 1978). All other selection taking place, i.e., selection among able students due to factors such as sex, social background, ideological or religious affiliation, etc., may then be called concealed or hidden. Returning to Häyrynen's (1970) classification, it is possible to take the intentional selection operated by educational institutions at different levels as corresponding to both the direct institutional selection (category 2) and the institutionally regulated self-selection. Depending on the philosophical and ideological bent of the researcher, he or she may attribute the concealed selection either to spontaneous self-selection (category 1) and/or to institutionally regulated self-selection (category 3) or to the effects of the macro-level distribution policy (category 4). The problem is at the heart of the debate on equality of educational opportunity. We shall return to this issue later.

Suffice it to say at this stage that according to the functionalistic view the problem is to plan the educational system in such a way that it meets the aspirations of individuals and the requirements of the educational and professional institutions, so that an optimum balance among occupations on the labor market is achieved (Merton, 1957; Häyrynen, 1970). The aspirations of individuals and their reasons for pursuing certain types of studies will be dealt with at some length in Chapter 3. We shall here concentrate on the goals and functions of the higher education institutions and also comment briefly on the broader aspects of the distribution of individuals at different social strata.

2.3 Goals and Functions of Higher Education

Before attempting to determine the aim of the selection undertaken in the educational institutions in general, and in higher education in particular, we shall take a look at the general goals of higher education in Sweden.

Education at all levels should promote democracy and economic and social development, and should allow citizens to improve their general culture and contribute to their personal development (SOU, 1973).[2] The

Governmental Commission on University Education of 1955 (SOU, 1957) defined certain general goals for higher education. The aim of all academic education, it was said, was that students acquire knowledge, skills, and, most importantly, "a scientific and critical mode of thinking" (SOU, 1957, p.71). Since then, a considerable change has taken place as regards the priorities expressed by the policy makers. In the terms of reference given by the Government to the 1968 Commission on Higher Education, it was stressed that policy measures in the field of education, especially post-secondary education, constitute one way of influencing the long-term development of society; furthermore, that all post-secondary education should be geared towards the future vocational activity of the students (SOU, 1973). The development that has taken place in Swedish higher education over the last 10-15 years seems to indicate that education adapted to the needs of the labor market and emphasis on internal efficiency of the system has received high priority in Sweden as compared to many other western countries (Elgqvist-Saltzman, 1976). A comparison between higher education in Sweden, the United Kingdom and the USA showed that goals, such as transmission of cultural heritage and various social norms, etc., were of importance in the U.K., whereas the role of education in personality development was emphasized in the USA (Gesser, 1968). A reaction against the increased vocationalization and efficiency ideology in Swedish higher education has been observed among both the conservatives, who wanted a higher priority to be given to the provision of "general culture" and the radicals, who felt that not enough importance was attached to "fostering critical thinking" (Elgqvist-Saltzman, 1976). The controversy concerned mainly the policy of making studies at the Arts and Science Faculties more vocationally oriented and of improving the graduation rates. Some measures in this direction were taken as early as the late 1960's, but the most explicit expression of this tendency was the reform of 1977, which abandoned the policy of completely open admission to these faculties.

Let us now return to the question posed at the beginning of this section: What is the rationale underlying the selection undertaken by the educational institutions? Häyrynen (1970) mentioned the optimal use of human resources as a primary concern of the recruiting institutions and refers to Etzioni's (1965) so-called "flow model" concerning the relation between selection and socialization. A central thesis underlying this model is that the more severe the selection at the entry regarding the behavior and attitudes to be developed, the less resources are required for socia-

lizing the individuals admitted, i.e., the higher the effectiveness of the organization. Etzioni distinguishes between socialization that "prepared for participation in the instrumental system (a preparation often referred to as training) or in the expressive one (a preparation that might be characterized as education minus training)" (Etzioni, 1965, p. 42). It is likely that the selection effected by the institutions of higher education influence first and foremost the "instrumental" socialization (Gesser, 1968).

The economist Lévy-Garboua (1977, p. 29) claims that in France (and probably in some other countries, too) the selection to higher education will remain economically inefficient until the initial selection is extended to all sectors of higher education. He wonders, for instance, why the medical and engineering schools are allowed to choose from amongst the brightest students, whereas other faculties have to content themselves with the remainder. Another argument used in favor of extended selection at entry to higher education is that the overall selection, i.e., attrition between initial entry and final graduation, is much lower at institutions with highly restricted intake as compared with those whose sole admission requirement is the baccalauréat.

The demand of policy makers for increased efficiency in higher education and the reforms undertaken over the last 10-12 years in Sweden have been based on less elitist considerations than those in for instance France and the USA. The equality issues were not excluded from the discussion on efficiency in higher education. The policy adopted by the National Board of Universities and Colleges reflected less a concern to screen students than to revise the content of the programs and to adapt the teaching-learning strategies to the new categories of students in higher education. (3)

Students in practically all branches of higher education are likely to acquire knowledge and skills that will be of use when they enter the labor market. Summarizing, the trend in the Swedish higher education policy is clear: the open admission sector is gradually showing a tendency already characteristic of the selective sector of higher education, even though during the 1970's "consumption" motives have been very frequent among students - particularly adult students - enrolled in the open sector. Another tendency during the late 1960's and the early 1970's was that some selective and vocationally oriented programs, for instance in economics and business administration, ceased to be selective.

To conclude this short review of the research on the subject, we should mention the more radically oriented social science researchers in Europe and the USA, who have related selection within the educational system to the macro-level distribution policy in society. For researchers such as Bernstein in England (1971, 1975), Bourdieu and Passeron in France (1970), and Carnoy and Levin (1976) in the USA, the transmission of knowledge for productive purposes does not constitute the real goal of formal education. Education is a means to undertake an efficient selection in order to reproduce and legitimize the existing social and economic structure in society. An excellent review of the so-called conflict theories of education is found in Karabel and Halsey (1977). Analyses of the development of education in Sweden, based on the conflict perspective, have been published by Lundberg et al. (1976).

2.4 Strategies in Previous Empirical Research on Enrollment in Higher Education in Sweden

This section will mainly deal with Swedish empirical studies. The studies presented here belong, for the most part, to the area of study or career choice, especially choice in higher education.

In the research on study and career choice there are several categories of investigations. Apart from differences in content and emphasis, we shall here deal in particular with differences associated with the various research designs. Studies of a longitudinal, follow-up, and cross-sectional type differ as regards the analytical approaches they lend themselves to, as well as the criteria employed.

2.4.1 The Concealed Selection

The scope of concealed selection has been thoroughly investigated in Sweden. This mainly concerns the relationship between educational choice at different levels and the socio-economic and geographical background of the students. Selection with respect to sex has become the subject of research only in recent years (Sellerberg, 1971; SÖ, 1975; UKÄ, 1975; Berner, 1975; Engholm et al., 1975). There are clear and persistent sex differences in choice of subject, sector, and type of education at the secondary and tertiary levels (Härnqvist, 1978).

A common type of study consists of cross-sectional studies which map out the accumulated effect in the selection process at a certain stage. Recurrent surveys of the composition of the student body upon enrollment at

universities and colleges are intended to illustrate to what extent the attempts at democratization in higher education have borne fruit. Studies of this type have, to a great extent, been carried out in connection with various inquiries of Government Commissions, the first of these dating from the mid-30's (e.g., Wiksell and Jerneman, 1935; Wiksell and Larsson, 1936; Moberg and Quensel, 1949; Moberg, 1951; Gesser 1971). In these investigations the student population has often been divided according to social class and sex. Geographical and regional factors have also been considered, for instance by Dahn (1936), Holm and Häggström (1972) and Fasth (1973; 1975; 1979).

Studies of the so-called "talent reserve" for further education at different levels after the compulsory school represent another line of research, the results of which seem to have been important for the comprehensive school reform in Sweden during the post-war period (Husén, 1975). Analyses of the relationship between various social factors and measures of aptitude in relation to choice of education and career have been carried out by Husén (1948 and 1950) and Härnqvist (1958). The latter also studied the influence of students' regional background. In this context, Boalt's study (1947) of an age cohort in Stockholm, tracing their course through the educational system, should also be mentioned.

Dunér (1974) differentiated between follow-up and longitudinal studies. The former he defined as studies based on empirical data not originally intended for use in the study of career development and similar aspects, whereas this would be the case with the genuinely longitudinal studies. In our presentation of previous research we shall, however, use the term "longitudinal" for all studies commencing at a point prior to the first selection within the compulsory school system and following up the groups under study at least as far as completion of secondary school. Multiple testing point studies which do not fall within this category are treated as follow-up studies.

The "doyen" among Swedish longitudinal studies is the one known as the Malmö study. The participants in this study were born in 1928 and have been followed since the age of 10. One of Husén's studies (Husén, 1950) on the talent reserve was based on this material. The broad perspective of the Malmö study has been stressed by Husén and his coworkers in later publications reporting their studies of the influence of early intelligence, school achievement and socio-economic background at different stages of the educational and professional career, and also in relation to their general

way of life (see, for example, Husén, et al., 1969; Emanuelsson, 1974; Fägerlind, 1975).

During the 1960's several longitudinal studies were launched in Sweden. The first data collections took place when the students were 13-14 years old, i.e., at the time of the first choice between optional courses in the compulsory school. These studies, the "Individual Statistics Project", the Örebro project, the Västmanland study, the Project Metropolitan, and the "Youth in Gothenburg" project, have shed light on transfer and drop-out among students from various social strata, with different aptitudes, etc., during the first few years after the introduction of the new comprehensive compulsory school (grundskola) and the upper secondary school respectively. Comprehensive descriptions of these projects can be found in Härnqvist and Svensson (1973), Magnusson, Dunér and Zetterberg (1975), Ljung (1974), Janson (1975), and Andersson (1969).

Another category of studies focussing on correlations between choice and socioeconomic background, also ought to be mentioned. The two types of investigations included in this category have in common that they deal with one single transfer (from a lower to a higher level). Firstly, we have cross-sectional studies which analyze planned choices among students who are about to complete one school level. The other group of studies is of the follow-up type, i.e., studies where information is available about the individuals in the sample both before and after the transfer. An example of the former type is Härnqvist and Grahm's analysis (1963) of students faced with the choice of going or not going to upper secondary school.

Follow-up studies of upper secondary school (gymnasium) graduates relating choice to socioeconomic background have been conducted by Svenningsson (1971), Gesser and Fasth (1973), Mählck (1974), and the Central Bureau of Statistics (SCB, 1976; 1979). It was characteristic of some earlier studies that they used "objective" measures to shed light on study and career choices but it has become more common to use the students' own motives and attitudes to explain their choices.

2.4.2 Aptitude, Achievement, Personality and Interest in Relation to Choice of Education and Career

It has already been pointed out that the intentional selection operating for entry to the tracks of upper secondary level which prepare for a higher education, and to programs at university level subjected to numerus clauses, is regulated on the basis of student grades. There is also a relationship

between grades and drop-out at all levels of the educational system, as well as between grades and the socioeconomic background of the students. In the studies of the relationship between socioeconomic factors and educational and career choice, which were presented in the previous section, grades have in general been held constant.

In the present section we shall deal with studies which have attributed a partly independent function to school achievements and aptitude in the analysis of choice of study and career. These may be studies which have focussed on achievement level and aptitude structure rather than on grade average. Another aspect concerns the students' own experiences and interpretations of previous achievements or their estimation of their own aptitude and the effect this may have on their aspirations, plans and choices. Personality and interest factors come into the picture here.

Moberg and Quensel (1949) and Moberg (1951) studied the relationship between special aptitude and tendency to continue studies after completion of upper secondary school. "Special aptitude" was defined in relation to the subject profile of the final grades in each upper secondary school track. Carlsten, et al. (1972) simulated enrollments in higher education for students of different socioeconomic background, using intelligence scores and school grades alternatively as predictors. In a report dealing with the most talented students a study was made on the extent to which students with high achievement on intelligence (aptitude) tests (administered in connection with graduation from upper secondary school) chose a long academic program (minimum 4 years) and a restricted (numerus clausus) type of program respectively (Bergman and Dunér, 1975). Ekehammar (1976; 1977) has developed a psychological cost-benefit model for career choice after upper secondary school. Both studies are part of the previously mentioned Örebro project. Mählck and Mattsson (1975) have analyzed the transition to higher education among gymnasium graduates with low or middle level grades. The probability of going on to higher education was assumed to be influenced by the students' socioeconomic background, parental support, achievements, liking of school and aspirations. Choice of post-secondary studies among students from the Science and Technology tracks in relation to their knowledge profile, subject interest, etc., has been analyzed by Mählck (1975).

The qualities or the "image" associated with a profession have also been studied. On the basis of Rosenberg's (1957) and Davis' (1965) research, Gesser (1968) had a group of university students assess the "image" of a number of academic professions. Finally, we should mention a group of

follow-up studies carried out on newly enrolled university students. Changes in choice of studies and career plans, and interruption of university studies have been investigated by Gesser (1968), Elgquist-Salzman (1970; 1973; 1976) and Cighen (1975).

The studies referred to in this section have been either of a cross-sectional type or follow-up studies covering one level or transfer from one level to another. The emphasis has been on survey data, but personal interviews were also utilized in some of the studies.

2.4.3 The Educational Alternatives Studied

In the two previous sections we have dealt with the factors in the selection process which have been studied in former research, as well as with the design of these studies. In the following section we shall consider some aspects concerning the criterion used, i.e., which choice situations have been analyzed and what groups of students have been compared. One problem, often only vaguely perceptible, is now emerging more clearly. Let us illustrate this by an example. On the one hand, we have the type of studies which indicate how the students at faculty X, Y and Z are distributed among different social strata. On the other hand, there are studies showing which final educational level and socioeconomic position individuals with different backgrounds have achieved, and which try to explain how the differences between these individuals have come about. In the first case, fairly detailed information is given concerning the results of the selection to the final stage of the formal educational system, but not how this selection took place. The other type of study is focussing on the mechanisms in the selection process and describes how the scope of drop-out from the system during the different stages are related to social background. It is, however, important to remember that very often the main purpose of longitudinal investigations is to study the process of development of the individual, including his adjustment, in a broad sense, to social and working life (Magnusson, 1977).

A longitudinal study initiated when the group of students under study are about 10-13 years of age can describe the selection up to the post-secondary level and explain, for example, what factors have been important in determining enrollment in higher education. Generally, it is more difficult to elucidate the selection for the various types of higher education. The original sample employed in a longitudinal study must be very large. The "Individual Statistics Project" (Härnqvist and Svensson, 1973;

Svensson, 1977, 1979) is the only case in Sweden where it has been possible to describe the selection to different types of higher education from a sample representing the whole unselected school population at the age of 13.

When comparing participants and non-participants in higher education, one often finds that within-group differences are larger than between-group differences. This dichotomy has also been used in cross-sectional studies and in follow-up studies which were initiated at the secondary school level. The difficulties arising when using such criterion are, among other things, when the two alternatives have not been put into any career and labor market perspective. Even though it can sometimes be difficult to link a certain educational choice directly to one particular profession, one must attempt to make the categories both at the secondary school and the higher levels as homogeneous as possible.

The Swedish sociologist, Bengt Gesser, has been a strong advocate of studying the choice of higher education against the background of the socio-economic and professional position associated with different choices of education. Gesser was the first to show empirically the increasing stratification within higher education. In his study of how the sex and socioeconomic composition of the student population in higher education in Sweden has developed from the mid-50's to the late 60's, he separated so-called prestige programs from other types of higher education (Gesser, 1971). This will be treated further in Chapter 6.

In some of the cited cross-sectional studies, "career plans" have appeared as a criterion broken down into professional areas and branches of business and industry. The most remarkable thing about the research which has dealt with choice situations in connection with going to higher education, is that stress has been laid on "continued studies" without consideration to the different alternatives open to the students who are about to enter the labor market. In addition, the motives for or against continued studies have been the subject of detailed investigation. One could perhaps gain increased understanding of why some individuals do not continue their studies after completion of compulsory school if one instead asked why they had chosen to start working, and, reversely, why the ongoing students did not choose to enter the labor market (see, Härnqvist and Grahm, 1963; Bengtsson, 1971).

Finally, we should like to point out another factor which limits the possibility of explaining what distinguishes between students who have chosen different programs in higher education. We are dealing here with a

group which is in many respects fairly homogeneous, consisting of individuals who had survived earlier selections. One could, therefore, expect generally lower correlations between choice factors and the criterion. In order to differentiate between individuals in different areas of study, it is necessary to obtain more specific information on personality factors, motives and interests. However, one can also here expect a certain uniformity.

2.4.4 Statistical-methodological Approaches

Until some ten years ago, simple bivariate analyses and cross-tabulations were practically the only statistical approach utilized in this area of research in Sweden. However, as early as 1947 Boalt made a pioneer contribution when he utilized a partial-correlation technique in his analysis of a group of Stockholm students, tracing their way through the school system. It was thereby possible to single out the effect which the students' socioeconomic background, aptidude and school achievement (grades) had had upon the transition between different educational levels, as well as upon interruption of study at different levels.

Gresser (1968) applied Coleman's multivariate technique (Coleman, 1964) to two previously published studies in order to get an estimate of the relative importance of sex, socioeconomic background, and grades at the transition from compulsory school to gymnasium, and from gymnasium to university.

Bergman and Dunér (1975), Mählck and Mattsson (1975), and Mählck (1975) used a regression type of analysis in their follow-up study of secondary school graduates at the university level. In the latter two studies the dependent variable was dichotomous.

Approaches of an explicit causal nature can be found in the research which has utilized path-analytical models. The Malmö investigation was the first in Sweden to use path models in the field of education (Bergling, 1975; Fägerlind, 1975). Obviously, path analysis is extremely well suited to the analysis of longitudinal data.

Notes

1. In the integrated system of higher education which came into force in 1977, the procedures changed. Admission to any type of higher education is now restricted, and applications for studies at the Arts and Science Faculties, etc., must now be submitted to the University Board of the region several months in advance. However, most students are admitted and the grade-point averages required nave, in most cases, remained low compared with what is required for the highly restricted programs.

2. On the basis of the work of various Governmental Commissions, L. Johansson (1970) identified three main sets of policy goals for education in Sweden and also discussed possible conflicts between these goals. According to Johansson (1971, p.8-29) one could distinguish between:

   1. individual-oriented goals or contributions of education to the fulfilment of needs of individual members of society;
   2. goals dealing with the adaption of the individual to the actual norms and needs (mainly economic ones) of society; and
   3. goals promoting societal change (in particular change towards increased equality in society).

3. A study by Dahllöf (1968) showed that the low graduation rates reported for the open admission faculties was exaggerated - especially when the goals of the students enrolled were taken into account, for instance, whether they intended to graduate or just take one or two short courses.

CHAPTER 3

DEVELOPMENT OF AN ANALYTICAL MODEL OF THE STUDY

3.1 Introduction

The present Chapter will present the analytical model of the study, the way it has developed, the selection of variables and the design of the analyses of our empirical data. The findings of these analyses will be reported in Chapters 5 and 6.

Evidently, there exists no single theory that can fully explain the differences in student choice and attainment in post-compulsory education. There are, indeed, very complex processes involved and it seems that the approach suggested by Rubenson (1975) in studying enrollment in adult education is also relevant to the type of problems faced in the present study. According to Rubenson we should:

> "....try to describe how different factors are related to each other and by using fairly simple models elucidate the recruitment process. In doing so the experiences and approaches of various domains within the field of the social sciences should be utilized." (Op.cit., p.11).

The analytical model employed in the present study comprizes a very limited number of all the factors that might conceivably determine choice of post-secondary education. For a more extensive review of the determinants of individual demand in education, the reader is referred to Härnqvist (1978).

The empirical analyses of the present study differ considerably from those previously conducted on the same data by the present author (Mählck, 1974, 1975; Mählck and Mattsson, 1975). The results of a series of reanalyses of the same data are presented here. Hopefully, the description of choice and selection for higher education in general, and different programs in particular, will appear more comprehensive and consistent than in the past. New or redefined variables have been added, others have been excluded. A series of comparisons between different faculties and/or programs have been made. The same predictive model has been applied throughout all the choices studied.(1)

The analyses conducted in the present study should be considered as rather descriptive and exploratory in nature. The main reason for this

is the fact that the data used in this study were not originally gathered with the specific purpose of explaining the phenomena which are the subject of the study. A continuous revision of the model and of the analytic strategy has been going on from the beginning of the project.

The present chapter will report previous development and describe in detail the content of the model employed in the present monograph. Since models developed within the Wisconsin study to a large extent inspired the development of our own models, the starting point here will be a short presentation of these earlier models.

3.2 Some Socio-psychological Models Presented in the Wisconsin Study

The name "Wisconsin study" will be used here to denote analyses carried out within a research program called "social and psychological factors in status attainment" (Sewell & Hauser, 1975). The early models of the project developed by William Sewell, leader of the research team, and his colleagues at the University of Wisconsin (Sewell & Shah, 1967; Sewell, Haller & Ohlendorf, 1970) constituted the very first attempts to give a comprehensive description of the causes of social mobility and status attainment. They sought to identify socio-psychological variables which could explain how the social background and early ability influence the choice of post-secondary schooling, occupational attainments, and earnings. Sewell and his colleagues examined the subsequent educational and occupational careers of a sample of young men who graduated from Wisconsin high schools in 1957. The very first models presented (Sewell & Shah, 1967, 1968) focussed on college plans, college attendance and achievement, as explained by the socio-economic background of the students, their mental ability, and parental encouragement used as a mediating variable. In the subsequent models the influence of "significant others" (parents, peers, teachers) as perceived by the students was also added. As far as methodology is concerned, the Wisconsin team used path analysis.

The extended socio-psychological model of achievement (Sewell & Hauser, 1975) was composed by the following variables (presented in the order they were introduced in the path analysis equations):

1. Socioeconomic Status (pre-determined) (father's education, mother's education, father's occupational status, parents' average income)
2. Mental Ability
3. High School Grades
4. Teachers' Encouragement

   Parental Encouragement

   Friends' College Plans
5. Student's College Plans
6. Occupational Aspirations
7. Educational Attainment (years of schooling after high school)
8. Occupational Status (seven years after high school)
9. Earnings (ten years after high school)

For details about the social psychological model of post-high-school achievement advanced by Sewell and Hauser (1975) the reader is referred to their monograph, p. 92.

The criterion variables of particular interest to the present study are student's plans for college, occupational aspirations, and educational attainment.

For several reasons, it had been our intention during the first years of the PUB project to replicate some of the analyses of determinants of educational aspirations and achievement undertaken by the Wisconsin team. During the late Sixties there was, however, a major methodological breakthrough in the research on the social status attainment process. The works of Duncan (1966 and 1969), Blau and Duncan (1967), Sewell and Shah (1967; 1968) and others attracted a lot of attention among researchers in this field. Wolfle

(1971) in his review of research on the theme "who goes to college" referred to Sewell as one of the pioneers in a new, promising development that sought to determine the causal relationship in students' educational and occupational choices.

There were apparently several similarities between the PUB project and the Wisconsin study as regards design and data base. In both studies the basic data were collected when the students were still in the terminal grade immediately prior to possible transfer to higher education. Secondly, with the exception of Wisconsin's mental ability measure, all the information used to explain educational aspirations and achievement was of the cross-sectional type. Thirdly, measures of all the salient factors identified by the Wisconsin study could in principle be constructed from variables the PUB project had inherited from the IEA survey.

The difference between the present project and the research conducted by the Wisconsin team concerned the scope of the study, the composition of the sample, and the specific variables employed.

The scope of our project was limited to an examination of who goes to higher education and what the determinants are of choices within the domain of higher education, whereas educational plans and achievements constituted only the first phase of the comprehensive Wisconsin model.

The high school graduates of the Wisconsin study constituted a less selected and more heterogeneous group than the graduates from the Swedish upper secondary school (gymnasium). In the Swedish case an important selection took place in the transfer from the nine-year comprehensive, compulsory school to the upper secondary school.

3.3 The First Analytical Model of the PUB Project

Enrollment in higher education constituted the ultimate criterion variable in the analytical model presented in Mählck and Mattsson (1975). We hypothesized that all the factors used by Sewell and Hauser (1975) to explain differences in years of schooling after high school (Educational Attaintment) were likely to influence the decision to enroll in higher education as well. Since it was felt that factors pertaining to student attitudes towards school and learning in general should also be considered, two other variables, Like School and Reading for Pleasure, were added to the model. It was decided, too, to take into account the content of the previous studies, i.e., the track the students had followed at the gymnasium.

The model is summarized below with the variables presented according to the order in which they were assumed to enter into the causal model:

1. Socioeconomic Status (SES) (father's occupation)
2. Verbal Ability
3. Track in Gymnasium
4. Grade Point Average (GPA)
   Parental Encouragement (reported by students)
   Like School
   Reading for Pleasure
5. Aspirations for Higher Education

It should be noticed that this model has only one measure of socio-economic background. With regard to "significant others" the only source of influence represented in the PUB-study was the student's perception of parental encouragement. Unlike the variables used in the Wisconsin project, in our study perception of parental encouragement was not directed towards aspiration for higher education. It was a general measure of parental support of their childrens' studies at the gymnasium.

Several problems emerged when the analytical model above had to be converted into a statistical one. Firstly, the fact that all the measures were of a cross-sectional type meant that the ordering of the variables could be questioned. Another problem, that of interdependency, arose from the assumption that four of the intervening variables mutually affect each other. Unfortunately, a general causal model which could take care of both interdependency and errors of measurement did not exist at the time the analytical model was developed. Thus, the analytical model seemed at first sight to lead logically to a causal statistical model, but for the reasons just mentioned a more simple and descriptive model had to be used. A predictive statistical model was, therefore, employed for the empirical analyses reported in Mählck and Mattsson (1975) and the statistical problems involved were discussed in detail in that report and so will not be commented upon here.(2)

The analyses were carried out on a subgroup of students, namely those, who because of low grades, did not qualify for courses with restricted intake, that is, the group we refer to as the "low-medium" one. The results of our analysis (Mählck and Mattsson, 1975) showed a strong influence of educational aspirations on decision to enroll in higher education. Aspirations and grades were important factors in this decision for both male and female graduates. The Socioeconomic Status (SES) was a powerful predictor

among females, while among males the correlation between SES and enrollment disappeared when other variables were taken into account. Furthermore, Track in Gymnasium, Parental Encouragement, and Reading for Pleasure seemed of some importance among males.

When we began to think of extending the analysis to include choice of type of higher education among the students of our sample, it soon became apparent that a critical re-appraisal of some of the factors used to predict enrollment in higher education in general was necessary. Firstly, it was not clear, conceptually, what the attitudinal variables in the model really represented. This was particularly true for the variable entitled Aspirations for Higher Education, but there was also a need for further specification of the hypothesized relationship between all the attitudinal variables. Secondly, the structural or built-in constraints of the educational system and their implications for choice of continued study called for further elaboration. The review of our analytical model will focus on these two aspects.

3.4 The Analytical Model Reconsidered: A Short Review of Some Attitudinal Dimensions Associated with Individual Choice

3.4.1 Some Basic Concepts

According to such leading developmental psychologists as Ginzberg (1951) and Super (1953; 1957), students - between approximately 18 and 20 years old - were likely to be more aware of the actual conditions prevailing and more realistic about future opportunities than they had been some 8-10 years before. (They had passed through the fantasy-filled stages of development to a more realistic one). The process tends to follow a highly ordered and predictable pattern, since individuals within the same culture are confronted with the same developmental tasks. The choices are very often irrevocable. They are the results of a compromise between the values and interests of the individual, his capacities, and the opportunities offered to him. A synthesis of different research approaches made by Super and Bachrach (1957) in the form of twelve basic propositions concerning the process of educational and occupational choice has often been cited. Super made an important theoretical contribution by introducing and defining the concepts of vocational maturity, coping behavior and the self-concept of the individual, and by making more explicit the expected relations between the different factors involved (and also by including factors reflecting the social environment of the individual). However, the formulation of these concepts is very

general, a fact which makes it difficult to test their validity (Andrae, 1972).

The famous conceptual framework for occupational choice by Blau, et al. (1956) defined choice as a result of a confrontation between subjective factors like interests and the more objective conditions and constraints existing. According to this model, the two key concepts involved in the individual's process of choice are his preferences for a certain type of study or profession, and his expectancies to be able to meet with the requirements of the alternative envisaged. Furthermore, the ultimate result, i.e., entry into a course of study or directly into a job, does not only depend on the individual but on the actions taken by the selecting agency - whether in the educational system or on the labor market - as well. These actions are in an analogous way the result of a compromise between preferences for candidates having a certain type of qualifications and/or motivation and a judgement of what one can realistically expect to get. The practices and conditions of the labor market at the different points of choice are not the only example of the influence of what Blau, et al. (1956) called "the social structure". The development of the individual's personality is to a large extent also a function of the social environment that existed at the different stages.

This is not the place to give a detailed description of the model developed by Blau, nor to discuss some of its implicit (and questionable) assumptions, such as the existence of a hierarchy of preferences and expectancies of achieving these preferences, or the assumption that the same rational behavior is displayed by all individuals (not recognizing that some are more inclined to take risks than others) and so on (Gesser, 1968). We believe, however, that for our limited purpose of clarifying the relations between some of the determinants of the individual's choice of level of education and of identifying the corresponding variables, the conceptual framework of Blau, et al. constitutes a useful point of reference, especially Härnqvist's (1978) further elaboration of it.

The framework model was originally devised to explain entry into an occupation. Härnqvist has demonstrated that the model can be used for analysis both of entry to studies with a numerus clausus and to courses with open admission.

Four points of major importance to the present study may be drawn from the model of Blau and his colleagues:

1. The pattern of factors determining expectancy and preference indicates a very complex relationship between the two, some factors being common to both, while others operate only through one of them.
2. Previous educational experience influences both expectation and preference.
3. The influence is direct on both, but also indirect via the immediate attitudinal determinants in the case of preference (possibly also in the case of expectancy).
4. Educational experience is composed by both objective and subjective factors that are intertwined.

In Härnqvist's (1978) illustration the immediate determinants of preferences are aspirations for different levels of education and interests in certain types or areas.

> "Both are affected by the student's previous educational experience: his liking for school in general and for different subjects which in turn interacts with the reactions to this achievement of parents, teachers, peers and other persons who are important to him." (Op.cit., 1978, p.38).

Educational achievement is also assumed, however, to affect the student's expectancies.

> "His expectations are influenced by his self-evaluation in general and by more specific information about the competitive strength of his earlier achievement." (Op.cit., 1978, p.38).

The determinants of expectations will be discussed in connection with the structural aspects later in this chapter.

Whether the interest component should be regarded as reflecting a vertical or horizontal dimension (cf. Härnqvist, 1978) or both, also depends on the educational alternatives that are compared and the specific interest content as well. The point is that two study alternatives which formally are at the same level in terms of admission requirements may lead to occupations that are very different in terms of earnings and social prestige. This is particularly true for studies at universities and university colleges, but it is to a certain extent valid within the upper secondary school too, as we shall see later.

3.4.2 Attitudinal Factors Used in Some Empirical Studies

The way the compromise between an individual's preferences for and expec-

tation of a particular alternative occurs has not been the subject of any systematic empirical research (Härnqvist, 1978). Most studies of educational choice have built on student characteristics, such as achievement, ability, interest, and on social background. There are, however, examples of investigations into what Blau, et al. (1956) term "immediate determinants" such as the student's perception of his choice situation, his motives for a certain choice, etc.

The study of Härnqvist and Grahm (1963) on choice of upper secondary education in Sweden constitutes a pioneer work in this field. In addition to the purely instrumental motives which they found among the majority of students, more than one third remained in school because of not having any definite plans about future occupation. This was a considerably higher proportion than those who stayed on because they preferred theoretical studies to practical work, but a somewhat smaller group than those "liking school" (an important reason advanced by female students).

The motivational patterns found by Härnqvist and Grahm (1963) among a fairly selective group of lower secondary school graduates were confirmed by Bengtsson (1971) a few years after the introduction of the comprehensive school reform. The second most important reason for choosing the gymnasium (after the occupational motive) was that the"gymnasium gives you a general culture and makes you learn things which will be of use later on in life" (Op.cit., p.46). As in the Härnqvist and Grahm study, Bengtsson found that whether the grades obtained were sufficiently high for the student to be admitted or not was very often mentioned as a reason for entering or not entering the gymnasium. According to a study undertaken by Gesser (1971), Swedish university students during the 1960's were remarkably consistent in their opinions on what factors had influenced their educational choice. For three samples of students who enrolled for the first time in 1960, 1964, and 1968 respectively, the following three factors (out of a total of 17) proved to be the most important:

1. Getting an interesting job as a result of the study chosen.
2. The study itself is interesting.
3. High likelihood of getting a job after completion of study.

Other questions asked of the same students confirmed the high importance the respondents attributed to study as such. The importance given was so strong that Gesser felt justified in interpreting it as reflecting an ideology of the intrinsic value of education.

Among the different motives influencing plans for enrollment in college among high school students, McDill and Coleman (1965) stressed the importance of an intellectual source which they call "genuine interest in learning":

> "Clearly the loss of talent between high school and college would decrease if ways were found to use the social system of the high school to strengthen the importance of interest in learning as a motivation to attend college." (Op.cit., 1965, p.126).

Meier (1970) referred to instrumental goals when students consider education mainly as a preparation for an occupation. The expressive goal is associated with preferences for intellectual development.

In his follow-up study of further education among 16-year-olds in Australia who participated in the IEA Survey, Rosier (1978) created a composite measure called "Humanistic Activities" which he defined as "activities reflecting the intrinsic educational values" (Op.cit., p. 150). The measure included items like Participation in Discussions on Religion and Politics and Amount of Reading for Pleasure.

3.4.3 Attitudinal Variables of the Present Study

In the Swedish national IEA report on achievement in science subjects (Husén, et al., 1973), the attitudinal variables assumed to explain differences in achievement were clustered into two scales: Like School and School Motivation. Husén, et al. (1973, p.168) stressed in their comments that using single items instead of aggregated measures would probably have resulted in a more diversified picture. This was how we proceeded when the attitudinal items of the IEA study were included in the first analytical model of the PUB project.

The results of the multivariate analysis clearly indicated that the variable entitled Aspirations for Higher Education has constituted the most important single predictor. A closer look at the variables, specially as regards the formulation of the original items and the conditions surrounding the administration of the instruments, seems to indicate that Aspirations for Higher Education was not an appropriate measure of educational aspirations. The variable was based on the following statement:

> "I hope eventually to go on to university or college" (the response alternative being "agree"/disagree".)

It should be kept in mind that the questionnaires were administered to the students a few weeks before the end of the school year. At that time most students probably had a fairly clear picture of what their grades would

be. In any case, those who intended to pursue their studies at faculties with restricted admission had had to send in their applications a month earlier, i.e., their decision had already been taken. Thus, the attitudinal statement did not have the same meaning for all the students of the sample. It is highly probable that the item had originally been formulated primarily in relation to the situation of the younger pupils who had participated in the IEA survey (10-14 year olds). In this case it would be justifiable to talk about educational aspirations, whereas for students who were about to leave the upper secondary school, one might infer that the variable reflected more their expectations regarding futher studies. But whether it does or not depends on the criterion variable used. This was not educational attainment or professional achievement as in the Wisconsin study, but enrollment in universities and colleges, which would in principle have taken place only a few months after the administration of the questionnaire. To our mind, this seems to indicate that aspirations for higher education and enrollment expressed a duplication of the same thing.

Härnqvist's (1978) elaboration of the framework of Blau et al. (1956) increased our awareness of the necessity to look for a measure that reflected differences in aspirations of a more stable and general character:

> "The vertical "aspirational" dimension of preferences is likely to have its counterpart among the explanatory variables in terms of more general tendencies in the individual to strive for status and achievement...self-evaluation, level of aspiration, achievement, motivation, all, logically at least, belong to this domain ..." (Op.cit., 1978, p.40).

The phenonenon thus described seems to be closely related to what Rosier called the "extrinsic aim of education for certification" (Op.cit., 1978, p. 114), which meant that education was primarily regarded as an instrument for attaining the desired occupation. The dimensions involved at the attitudinal level were "commitment to present and future education" (Op.cit., 1978, p.115). Two items of our data set that seemed to correspond to the aspects mentioned above were identified:

"Important to do well in school"

"Wish to get as much education as I can"

In the present study, then, the two items will constitute a new aspirational variable, Ambition.

In a previous report (Mählck and Mattsson, 1975) the present author tried out two items which might serve as surrogates or proxy variables for the intrinsic or non-instrumental aspects of educational choice. The first related

to work in school (gymnasium) and to what extent the students liked or disliked school in general.

According to the results presented in the Swedish national report on the IEA Science study (Husén et al., 1973) graduates of the three-year gymnasium ranked considerably higher on the Like School scales that the graduates of the two-year continuation school. It has been argued that one of the reasons why more theoretically oriented students take more interest in or develop more positive attitudes towards school and education in general is that the teaching is more adapted to the needs of this category of students (Sandven, 1968).

The results of the analysis of enrollment in higher education indicated a positive, though fairly low, correlation between Like School and going to university. The correlation disappeared altogether when other factors, in particular general achievement, as defined by grades, was controlled for (Mählck and Mattsson, 1975). This finding is not surprising. Like School might have been a powerful variable in predicting enrollment in gymnasium after the compulsory school, but could hardly be expected to discriminate among the students of the highly selective group at the end of gymnasium, especially as studies at the universities and other institutions of higher education are organized very differently from those at the gymnasium. Thus, even secondary school graduates who disliked the way work was organized in school would probably not have hesitated to continue their studies at the university for this reason. Like School will not, therefore, be used in the subsequent analyses of attendance in higher education.

On the other hand, the analysis clearly indicated the existence of a strong relation between Reading for Pleasure and higher education attendance among males. (The students from the Technology track were excluded from the analysis). In Rosier's study (1978), Humanistic Activities (including Reading for Pleasure) accounted for a substantial part of the explanation as to why 16-year-olds in Australia preferred to remain or to leave school. By definition, Reading for Pleasure is an out-of-school activity, though it is probably influenced by what is taught in school (an influence which may or may not go in the direction desired by the teachers). We shall use the variable Reading for Pleasure as an indicator of the secondary school graduates' general intellectual orientation. Using Reading for Pleasure as a variable in predicting choice of higher education means that we assume that those who spent much (or little) time reading for pleasure in the upper secondary school will continue to do so after graduation.[3]

3.5 Structural Aspects

3.5.1 Introduction

Kerckhoff, as reported by Alexander, Cook and McDill (1978), has made a critical appraisal of the recent status attainment research in the USA. According to Kerckhoff the research on educational attainment has relied too heavily on the processes of socialization to explain differences in students' motivations and values.

> "This has led to a neglect of the structural constraints in the social organization of schooling which may condition educational outcomes entirely independent of the kinds of inter-personal and subjective processes so important to the Wisconsin model". (Op.cit., 1978, p.47).

Recent empirical studies in the USA using a more structural approach have focussed on the importance of enrollment in a college or non-college track for the subsequent educational and professional career of high school graduates (Alexander and McDill, 1976; Alexander et al., 1978).

The way the Swedish educational system is organized and in particular the strong links existing between the different levels of the system, make it essential to consider how the structural characteristics are related to individual choice. Different terms have been used to denote the direct or indirect influence of systems' characteristics on individual choice: "frame factors" (Dahllöf, 1971), "selective or structural barriers" (Husén, 1975), "institutional determinants" (Härnqvist, 1978). The scope and the context in which these terms have been used may vary somewhat, but basically they express the same type of phenomenon. To obtain a clearer picture of what the actual situation of choice is and of what opportunities are offered to different categories of students in our sample we shall start by looking briefly into some of the factors operating at the level of higher education that are likely to influence the choice the students make and how these are related to systems factors at the secondary level. In Härnqvist's (1978) terminology the former are called "conditions anticipated in the choice situation" and the latter "conditions antecedent to choice".

3.5.2 Antecedent Conditions of Admission, Failure, and Job Prospects

Before the new reform on higher education came into force in 1977, admission to universities and university colleges in Sweden was conditional upon the students having completed three years of gymnasium study after the compulsory school.[4] This meant in reality by 1970-71 that to be eligible for

studies in higher education the student had to pass through one of the following tracks:

- Humanities
- Social Sciences
- Economics and Business Administration ("Economic")
- Science
- Technology

This is to say that, in principle, all the students of our sample were entitled to enroll in some type of higher education.[5] However, the special qualifications required for admittance to certain branches of higher education meant that the number and quality of study alternatives available to graduates varied considerably. Those who had studied mathematics and science subjects could, provided their grades were high enough, choose between virtually any of the courses of higher education. Those who had opted for humanities, social or economic subjects when entering the gymnasium could not switch to science-based programs without sitting for supplementary examinations. During the 1960's and early 1970's, a fairly small percentage of graduates, with privileged background, took advantage of this possibility, most often in order to get additional credits for admittance to the most selective and prestigious courses in higher education (medicine, veterinary science, dentistry, etc.).[6] The possibility of compensating, at least partially, for low or inadequate grades by taking single university courses was discontinued early in 1971. This possibility is, thus, likely to have had only a minor effect on the educational decisions of the students in our sample since they graduated in 1970.

In the light of what has been said so far, one would expect students enrolling in science curriculum at secondary level, i.e., students of the Science and Technology tracks, to continue to higher education more frequently than other students. There is, however, another dimension that needs to be considered, namely the degree of academic orientation or its antithesis, i.e., vocational orientation, that characterizes the five tracks qualifying for higher education.

It may appear paradoxical to distinguish between academic and non-academic tracks when both prepare for studies at university or university colleges. However, some constitute a more appropriate preparation for university education than others. Before 1965, two types of gymnasium existed, the general or academic gymnasium, which prepared for studies at the university level, and the specialized gymnasium giving professional training

for future middle-level engineers and their counterparts in the fields of business administration and economics. The reform of 1965 constituted an important step towards a comprehensive upper secondary school. The two- and three-year programs in business administration and engineering respectively were extended by one year, more emphasis was placed on theoretical subjects, and, finally, the separate general and specialized gymnasia were merged into a single organization, the gymnasium. The new comprehensive organization consisted of five different tracks with the following major orientations, according to the final report of the 1960 Royal Commission (SOU, 1963). The Economics-Business Administration and Technology tracks prepared primarily for professional activities in industry or public administration. We shall hereafter call these the "semi-vocational" tracks. The Humanities, Social Sciences and Science tracks, hereafter termed the "academic tracks", would provide an adequate preparation for studies at various institutions of higher education.(7)

There is some evidence to show that it was easier to obtain access to the semi-vocational tracks than to the academic tracks in the new comprehensive gymnasium. There was a remarkable stability in this respect during the period 1965-1973. (Eriksson, 1967; Henrysson and Jansson, 1967; SCB, 1974a). The students enrolled in the Economic and Technology tracks ranked lowest in terms of grade-point average from the compulsory school, the science students were highest, whereas those who had followed Humanities and Social Science tracks constituted an intermediary group. Another tendency reported is still more striking: the initial differences between tracks as regards performance measured by average grades seem to prevail throughout the three years in the gymnasium (SCB, 1974b).(8) The social composition of enrollment in the various tracks differed too. There was a relatively high proportion of students from under privileged homes enrolled in the semi-vocational tracks (Gesser and Fasth, 1973; Mählck, 1974).

To summarize, we would expect graduates from the Economic and Technology tracks to go to higher education less often than other graduates. Whatever their motives once were to enroll in these tracks, and whatever the competitive strength of their grades, to pursue their studies further would mean a greater sacrifice to them - or higher foregone earnings, to use the terminology of the economists - since they would not immediately benefit from the vocational training they had already acquired (see Ekehammar, 1976).

3.5.3 Anticipated Conditions

In his elaboration of the framework of Blau et al. (1956), Härnqvist (1978) distinguished between two categories of future conditions that the student has to anticipate in his choice of studies (including no further studies at all). In the first category, which relates to the educational system itself, Härnqvist emphasized two aspects: admission and selection to different courses in higher education, as well as their geographical availability. The second category comprized occupational and economic factors and especially employment prospects, rate of returns, etc. associated with various programs in higher education.

Admission and selection has been discussed earlier but will be more extensively treated in Chapter 6. The same applies to conditions outside the educational system. As regards geographical availability, let us just mention that disparities in educational supply between regions diminished considerably during the 1960's and 1970's in Sweden, although the number and types of courses offered at the newly created universities are not yet totally the same as those existing at the older ones.

3.5.4 Structural Conditions Considered in the Present Study

The highly centralized and open character of admission procedures to higher education in Sweden has made it possible to gain access to information about the grades required for entrance to practically every type of university or university college courses during the period covered by the study. With the exception of certain marginal cases, we have thus been able to identify the formal opportunities of every single student in our sample since their grade-point averages were already known. We have used this information to group courses in higher education whose entrance requirements were similar, and then to repeat the same exercise for the students as regards their grade qualifications. Thus, this enables us to get a clearer idea of the self-selection that has taken place. These procedures will be discussed further in the section on the design of the analyses later in this Chapter.

A second criterion used to group and select the courses to be included in our analysis was the expected life-incomes of the professions these courses normally lead to. The details are given in Chapter 6.

We have, unfortunately, not been able to cover regional differences in supply of higher education courses, nor the employment situation at regional and local levels for the students in our sample.

Track membership is the only structural factor antecedent to choice that was available in the present study. In the first analytical model employed in our project described earlier in this Chapter, track was used as a variable to predict enrollment in higher education among students with low or medium grades (Mählck and Mattsson, 1975). The variable was constructed as an ordinal scale ranging from Science (high), Humanities and Social Sciences (medium) to Economic (low) in terms of the students' likelihood to go on to higher education. Students from the Technology track were excluded from the analysis in order to facilitate comparisons between sexes.

In the light of what has been said in the previous sections, the approach will be somewhat modified. In an overall analysis of enrollment in higher education, a new structural predictor variable, Program, will be used. It consists of two categories: semi-vocational tracks and academic tracks. In the second stage of the analysis the subject matter aspect will be held constant by analyzing science and non-science programs separately.

3.6 The Revised Analystical Model

To recapitulate, the variables of the model identified were:

- Socioeconomic Status of the Home
- Parental Encouragement
- Program in Gymnasium
- Grade Point Average (Grades)
- Ambition
- Reading for Pleasure

Following the logic of the framework spelled out previously (Blau et al., 1956; Härnqvist, 1978), one could in the first place conclude that the two measures identified as proxies for the extrinsic and intrinsic aims of education correspond to aspiration and interest, the immediate determinants of the individual's preferences. Secondly, regarding the determinants of expectancy, no measure of self-assessed ability is available. The only possibility would be to infer this concept from the available measure of educational achievement, i.e., the Grade Point Average. For this purpose it is important not to compare students whose "objective" opportunities of choice are widely different. Thirdly, Grades would also be assumed to influence the preference aspect of educational choice via Ambition and Reading for Pleasure.

Since only cross-sectional data are available, other interpretations would be possible. Thus, Ambition might be a less specific measure than it appears, in that it reflects general basic motivational traits in the individual that have operated throughout his entire schooling. In such a case we would have a measure such as what Härnqvist (1978) calls "general tendencies in the individual to strive for status and achievement". The influence of such a factor would then be:

> "mediated through achievement: they influence achievement and achievement opens up possibilities for choice. It is very likely, however, that motivational variables of this general kind also exert a direct influence on choice of level in the educational system". (Op.cit., 1978, p.40).

One could also consider all the attitudinal variables, including Parental Encouragement, as interacting with achievement. The important point is, however, that achievement (Grades), Ambition, and Reading for Pleasure are expected to have an independent and direct effect on choice of higher education, apart from the effect they share.

The argument advanced about Ambition could also be made for Reading for Pleasure. We could consider it either as a measure of the intellectual orientation behind the decision to enroll in the academic tracks of the gymnasium, or a measure of current cultural consumption. Students enrolled in these tracks are on the average assumed to display higher aspirations and read more in their leisure time than those of the semi-vocational tracks. The graduates who decide to attend universities or colleges are assumed on the average to have higher ambitions and to manifest more intellectual or cultural interest than those who enroll in shorter vocational courses or who enter the labor market directly after school.

The socioeconomic status of the parents is assumed to have remained stable over the years and by this token to have exercised an influence of the longest duration on students' aspirations and behaviors. Parental Encouragement is assumed to channel some of the influence of the social background. However, one cannot be too certain on this point. Conflicting tendencies may well be imagined. For example, even though we could on the average expect more active support by parents of upper social strata or by parents whose children are enrolled in academic tracks, the opposite may also be true. It could be that simply because it is taken for granted that their youngsters should go on to university after gymnasium, parents do not need explicitly to insist on this.

Finally, apart from looking at the relative importance of the four basic variables, Sex, SES, Program and Grades, for enrollment in higher education, Sex will not be included as a variable in the model employed in our analysis of aspirations and preferences. As in most previous studies undertaken in this field, it is more meaningful to compare the predictor patterns of males and females. The statistical problems involved, for instance, complicated interactions, in using Sex as a variable in a regression type design, provide justification for analyzing males and females separately.

3.7 The Overall Design of Our Analyses: Educational Alternatives and Criterion Groups

The principle that will be followed in the empirical analysis is that of studying increasingly specicif study alternatives among increasingly more homogeneous groups in terms of previous educational experiences.

The different stages in the empirical analysis are:

Group of graduates (Gymnasium)	Study alternatives (Higher education)
1. All graduates (whole sample)	Enrollment in higher education vs. non-enrollment
2. Graduates grouped according to previous studies (whole sample)	idem.
(a) Graduates from the science sector (Science and Technology tracks)	idem.
(b) Graduates from the humaninites-social sector (Humanities, Social Sciences and Economic tracks)	idem.
(c) Subgroups of each track separately	idem.
3. Graduates grouped according to previous studies and grades obtained ("low-medium group")	idem.
4. Graduates enrolled in one course as opposed to another, by sector	
(a) Graduates from the humanities-social sector	Studies in law or economics and business administration vs. enrollment in the humanities or social sciences

(b) Graduates from the science sector qualified for study at Institutes of Technology	Studies at Institutes of Technology (engineering) vs. studies in science at the university
(c) All female graduates qualified for study at Teacher Training College	Studies in teacher training vs. studies in humanities, social sciences, or science at the university ("open admission" faculties)

The first analysis concerns the overall decision to enroll or not to enroll in higher education, i.e., university or university college type of education. It is expected to give a global assessment of the impact of enrolling in an academic or non-academic university preparatory program, no consideration being given to the specific content of the subjects studied. The last point will be covered in the subsequent stage (Stage 2), the result of which will hopefully give a more detailed picture, since we know that students who have followed a science curriculum in the gymnasium have access to a wider range of higher education courses and are also the only ones eligible for some of the most selective and prestigious courses. The analyses will thus use the track membership as a criterion for stratifying or grouping the students of the sample. This will be supplemented by an analysis where the profile or the predictor pattern of each track will be brought into focus.

In addition to looking at the opportunities or constraints as regards options available in higher education implied by the student's previous educational choices, we shall at the third stage consider in a similar way his past performance, i.e., grades obtained. The students will here be classified on the basis of:

a) the information concerning minimum grades required for entry to different courses which is published several times a year by the central admission agency of the National Board of Universities and Colleges;
b) the grades obtained by each individual student of the sample.

If we compare the choices of students who qualified for the same level of education and the same type of courses, the self-selective aspects involved will stand out more clearly.

The analyses in Stage 4 will attempt to elucidate the growing stratification within higher education, or the fact that there is considerable variation in expected income and social prestige associated with different types of programs or courses. A special section will be devoted to choice between traditional academic higher education and what seems to be an increasingly acceptable alternative among able gymnasium leavers, at least among female graduates, namely, primary school teacher training.

Finally, it would be appropriate to introduce a word of caution before proceeding to the detailed description of the data set. It is important to keep in mind that our analysis of educational choice after gymnasium is based entirely on enrollment records kept by the universities and university colleges. In the selection of students for courses with restricted intake, there are three stages preceding the actual commencement of study:

1. The candidate sends in his application.
2. The competent authority reviews and finally accepts his application.
3. The accepted candidate decides to attend the course he or she has been admitted to.

We lack information concerning students in our sample who a) did not apply for a particular course; b) applied but were not admitted, or c) were admitted but finally chose another course. This seriously restricted our ability to provide an adequate description of the selection and self-selection that has taken place.

Notes

1. Program in secondary school has been used as a predictor variable only in the analysis of what determines enrollment in higher education in general.

2. This approach gives estimates of the relative importance of each variable in the model, i.e., a measure of the power of each variable to predict choice of higher education, when the influences of the other variables are controlled for. It also allows identification of factors of general importance and those of specific importance in certain subgroups. In view of the properties of the variables, Multiple Classification Analysis (MCA) seemed to be a more appropriate choice than Multiple Regression (cf. Nie et al., 1975).

3. Ekehammar (1977, p.965) made the same assumption when constructing the components of his psychological cost-benefit model for career choice.

4. There were exceptions to this general rule. Adults, persons of 25 years or more, having at least five years working experience could apply for admission to certain courses at the faculties of Arts and Sciences. From 1972 this possibility also existed for students who had completed their studies at any of the two-year tracks of the upper secondary school, provided their knowledge of basic subjects like mathematics, Swedish and English was adequate.

5. Provided that the average grades obtained in the final year of upper secondary school were not below 2.3 on a scale ranging from 1.0 - 5.0. Less than 5% of the graduates in our sample belonged to this category.

6. Very often the same students had made a choice when entering the gymnasium not to apply for the Science track, which would have been the normal choice for entry to certain types of higher study, medicine for example, but opted instead for a less competitive track such as Social Science in order to get higher grades. It is understandable that since there were no entrance examinations at the university level, the competition for grades in the gymnasium, in particular the Science track, was high. Transfer from Science to other tracks was widespread at the end of the 1960's and the beginning of the 1970's (Richardsson, 1968; SÖ, 1975).

7. The recommendations of the Commission were based on a survey among employers and educational institutions likely to receive the secondary school graduates (Dahllöf, 1963) and a study on student attitudes towards different study and vocational alternatives (Härnqvist and Grahm, 1963). The latter showed that the occupational motives behind a particular choice were more important among students of the then specialized gymnasia (engineering and business administration) than among those enrolled in the general gymnasium. Härnqvist and Grahm (1963) identified some subgroups whose track enrollment was to a certain extent motivated by their negative feelings about some of the subjects available to them. The most obvious case was that of students pursuing humanities studies whose choice was determined in part by their desire to avoid taking mathematics and science subjects. The study undertaken by Bengtsson (1971) confirmed this picture.

8. This could be an indication that the social and learning environment in the school for students of the non-academic tracks is different, i.e., the students' eventual academic aspirations are not encouraged by classmates, teachers expect less from their students, etc. (see, for instance, Alexander et al., 1978).

CHAPTER 4

DATA SET, SAMPLING, AND DESCRIPTION OF THE GYMNASIUM SAMPLE

4.1 The IEA Data Set: Student Background Characteristics and Secondary Schooling

The PUB Project drew upon data from three types of IEA instruments: cognitive tests, affective tests, and the student questionnaire. Students in the 1970 sample were tested in Natural Sciences (Biology, Chemistry and Physics), Literature, and Reading Comprehension. The affective tests measured both general attitudes (mostly dealing with the student's perception of school life and of his learning situation), and subject-specific attitudes and interests. The questionnaire elicited background information on the student and his parents. There were also some measures on the student's perception of his home environment. A section of the questionnaire contained a word knowledge test, which was intended to provide a general measure of the student's verbal ability (Thorndike, 1973). Fuller details are given in the international reports (Peaker, 1975; Walker, 1976) and the Swedish national report (Husén et al., 1973).

4.2 Sampling

The IEA survey used a two-stage stratified probability sample. At the upper secondary school level (gymnasium and fackskola), the different tracks in the respective school forms constituted the strata. The school was the primary sampling unit, and the individual student was the secondary sampling unit. Since only one class was to be tested per sampled school, one student in each school was drawn at random. All students in that student's class were then drawn for the sample. In order that the sample should be geographically representative, the list of schools used in drawing the sample (Central Bureau of Statistics' national register at schools for the academic year 1968/69) was arranged by county and by municipality within counties. During the execution of the field-testing, certain deviations from the original sampling plans were unavoidable. The probability of entering the sample therefore varied slightly for different schools and students. In order to assure that these deviations from the design sample did not disturb the sample's representativity, stratum weighting was applied. Thus, all students were assigned stratum weights which were in inverse proportion to the probability of entering the sample (Husén, et al., 1973, p.37). The target population in the present study were students who were in the last grade of the academic upper secondary school (gymnasium) 1969/1970, and who graduated in the spring of 1970.

Altogether 2053 students from the three- and four-year tracks of the gymnasium participated in the IEA survey. The sample comprized nearly seven per cent of the population. Approximately half of all gymnasium schools were represented (Husén et al., 1973, p.42). Data concerning Grade Point Average for these 2053 individuals were collected from the Central Bureau of Statistics (SCB). In order to make the follow-up study meaningful, a minimum requirement to enter the final sample was that information on SES, Sex, Gymnasium track and Grades were available. Within this group the non-responses in selected variables were analyzed (Table 4.1). The 1655 individuals who met this requirement defined the Gymnasium sample. The composition of this group is described below. For the analyses of choice of higher education presented in Chapters 5 and 6, a more restricted group consisting of 1497 students will be used. For these analyses two categories of students of the Gymnasium Sample have been eliminated: (a) students whose Grade Point Average falls below the minimum requirements for entrance to higher education, and (b) students enrolled in teacher training. A special analysis of the teacher training group is presented in the last section of Chapter 6. Teacher training for primary school teachers was at the time of our investigation formally not a part of higher education but, as we shall see, constituted an alternative to traditional higher education. Strictly speaking, these students are neither ongoers nor non-ongoers.

An analysis of the missing data was carried out. In this analysis, three central variables included in the analyses in Chapters 5 and 6, Socio-economic Status (SES), Parental Encouragement, and Ambition, were selected.

Table 4.1 Grade Point Average for Respondents and Non-respondents in Selected Variables

Variable	M	SD	n	Significance test F
SES				
Observed	3.25	0.66	1655	
Missing	3.14	0.64	405	8.01^{xxx}
Parental Encouragement				
Observed	3.24	0.66	1762	
Missing	3.12	0.64	298	8.64^{xxx}
Ambition				
Observed	3.25	0.66	1748	
Missing	3.09	0.63	312	15.8^{xxx}

^{xxx} = significant at ,001 level.

In Table 4.1 the amount of missing data is shown in relation to Grade Point Average. For all the three variables examined, it is seen that students who did not respond to questions about SES, Parental Encouragement or Ambition had significantly lower Grades than those who did respond. The difference was greatest for the variable Ambition. Since, as we shall see, the average Grades of the non-ongoers are lower, it is likely that by eliminating the non-response group, the proportion of non-ongoers is underestimated in the analysis.

An idea of the representativeness of the Sample can be obtained by comparing the composition of the Sample in terms of Sex and Track with the corresponding distribution reported in public statistics. In Table 4.2, statistics about all the gymnasium graduates in the Spring of 1970 are presented. For the follow-up study, the distribution within the reduced group consisting of 1497 individuals is of particular interest (Table 4.2, column 1). Our sample corresponds fairly well with the target population. Students in the Humanities and Social Sciences are slightly under-represented, while students of the Economic track are somewhat over-represented.

Table 4.2 Number of Students in Final Grade of the Gymnasium in Spring Term 1970. Distribution by Track and Sex.

	(1) Primary Group of the study		(2) Group includ.students with Grades < 2.3 and students enrolled in teacher training		(3) The population, i.e. students grad.from Gymnasium, Spring-70 (Stat.Yearbook 1970)	
Track	n	%	n	%	n	%
Humanities	250	17	289	18	6123	20
Social Sciences	319	21	356	21	7118	23
Economic	283	19	292	18	4888	16
Science	421	28	462	28	8551	28
Technology	224	15	256	15	4297	14
All	1497	100	1655	100	30 977	100
Females	670	45	762	46	14 339	46
Males	827	55	893	54	16 638	54

4.3 The Follow-up Data Set: Student Activity after Graduation from Gymnasium

The follow-up period stretches over five academic terms, i.e., two and a half years after the bulk of the students had left upper secondary school, from the Autumn term 1970 to the Autumn term 1972. (Approximately 80 per

cent of the technology students completed the fourth gymnasium year and thus graduated at the end of the Spring term 1971.

Information on post-secondary school activity is based on records from the Central Bureau of Statistics (SCB). Information on students in the whole country who enroll in any form of university or college education is recorded in a special file. In addition, information is available on admission to primary school teacher training. For all persons found in the file during the follow-up period, there was information on, inter alia, enrollment by faculty and term of enrollment. In addition, the file contains information on change of faculty and when this occurred. For students at Institutes of Technology and in the open faculties, i.e., Humanities, Social Sciences and Sciences, there is also information on choice of department, program and subject. It is, however, only for the open faculties that information on study activity was available, i.e., number of credits obtained by subject for each term, drop-outs, etc. Previous surveys have shown that it is among students at these faculties that the proportion of those not intending to complete a degree and failures have been greatest (SCB, 1975; 1976).

Information is available for all students in our sample on enrollment by faculty. No information about activities of those who did not enroll in higher education is to be found on the file of the Central Bureau of Statistics. In our analyses these individuals have been treated as "not participating in higher education" or denoted as "non-ongoers". It is important to note that the first program of enrollment after completion of upper secondary studies has been used as dependent variables in the analyses. It is not possible to establish any "definitive" educational and occupational choices. Comparability within the sample lies at the center of the present study.

4.4 Composition of the Gymnasium Sample

4.4.1 Socioeconomic Background and Track

In connection with the discussion concerning the representativeness of the sample (Section 4.2), the focus was on Sex and Track. We can establish from Table 4.3 that boys were dominant in the Science and Technology tracks, girls were concentrated in the Humanities and Social Science tracks, and the Economic track consisted of approximately equal numbers of boys and girls.

As a measure of the social composition, we have used an approximation of the social group categorization which frequently appears in Swedish educational research. The classification is based on father's occupation and consists of the following categories:

Social Group I: upper class and upper middle class

Social Group II: middle and lower middle class

Social Group III: working class

The three social groups have been obtained by combining the nine IEA categories (Husén et al., 1973).(1)

It is of interest to get a general impression of the magnitude of the social selection up to the time of graduation from gymnasium. Let us begin by examining the social composition among youths in the age groups relevant for higher education. On the basis of the data published by the Commission on Low Income (S.Johansson, 1970), Gesser (1971) made an estimation on how 20-year-old men in the whole working population were distributed across the three Social Groups during the late 1960's. According to these estimates, 11 per cent belonged to Social Group I, 39 per cent to Social Group II, and 50 per cent to Social Group III.

The social composition of the enrollment in the various tracks in the gymnasium is shown in Table 4.3. Compared to the figures for the entire age group mentioned above, the social imbalance is obvious.

Table 4.3 The Social Composition of the Sample: Percent Distribution by Track in the Gymnasium.

	All				Males				Females			
SES / Track	Low III	II	High I	n	Low III	II	High I	n	Low III	II	High I	n
Humanities	25	40	35	(289)	19	31	50	(32)	26	42	33	(257)
Social Sciences	24	49	27	(356)	25	43	32	(155)	24	54	22	(201)
Economic	31	49	20	(292)	34	44	22	(144)	28	54	18	(148)
Science	24	45	31	(462)	23	44	33	(306)	24	48	28	(156)
Technology	39	41	20	(256)	39	41	20	(256)	-	-	-	-
Total %	28	45	27		30	42	28		25	49	26	
n	(458)	(751)	(446)	(1655)	(264)	(380)	(249)	(893)	(194)	(371)	(197)	(762)

Within the highly selected group, Social Group I is over-represented in the more theoretically oriented tracks, i.e., the Humanities, Social Sciences and Science. Students from Social Group II are strongly represented in the Social Sciences and Economic tracks, and Social Group III is best represented in the "semi-vocational" tracks, i.e., the Technology and Economic tracks. This pattern applies to both sexes.

4.4.2 Grades

In comparing Grade Point Averages for the different tracks, it is important to keep in mind that this measure is based on different combinations of subjects. The dividing line goes between the two tracks with Technology and Science contents and other tracks. As can be seen in Table 4.4, the Grade Point Average tended to be significantly lower in the semi-vocational tracks, Economics and Technology, than in the theoretically oriented ones. Men in the Social Science track who constitute a low-grade group, are an exception. Following what has been mentioned above, it is also clear that grades were highest for students from Social Group I and lowest for those from Social Group III. Tables showing Grade Point Average in relation to Track and SES are reported in Appendix A.1-2.

Table 4.4 Students' Grade Point Averages at the Graduation from Gymnasium. Distribution by Track and Sex.

Track / GRADES	All			Males			Females		
	Mean	SD	n	Mean	SD	n	Mean	SD	n
Humanities	3.32	0.66	(289)	3.41	0.74	(32)	3.31	0.65	(257)
Social Sciences	3.22	0.60	(356)	3.09	0.60	(155)	3.32	0.58	(201)
Economic	3.15	0.54	(292)	3.18	0.59	(144)	3.13	0.49	(148)
Science	3.36	0.72	(462)	3.30	0.75	(306)	3.48	0.64	(156)
Technology	3.09	0.71	(256)	3.09	0.71	(256)	-	-	-
Total	3.24	0.66	(1655)	3.19	0.70	(893)	3.31	0.61	(762)

4.4.3 Parental Encouragement, Reading for Pleasure and Ambition.

In total, one third of all students sampled had responded "often" to the questions concerning the extent to which parents encouraged them to read during their spare time, and 30 per cent indicated that this "never" happened. Thirty-eight per cent of the girls responded that their parents often encouraged them. The corresponding figure for boys was 28 per cent, (Appendix A.3). Students devoted on the average slightly more than two hours per week to reading during their free time. The female students read somewhat more frequently than their male classmates, (Appendix A.4). Ambition showed no significant sex differences. Slightly more men were found in the lowest category of that variable, (Appendix A.5).

A list describing the characteristics of each of the above mentioned variables, i.e., items included and coding categories, is annexed to the present Chapter.

Notes

1. The Social Group measure which dates from the beginning of the century has often been severely criticized. The assumptions underlying this classification are not very precise, although it seems that the educational component, i.e., level of formal education attained, constitutes the predominant factor (S.Johansson, 1970; T.Husén, 1975). However, it has got the advantage of enabling comparison with other studies.

2. Comparison with Gesser and Fasth's (1973) follow-up study of 1200 individuals who graduated from gymnasium in 1971 showed that the proportion of youths from working class homes, i.e., Social Group III, which is easiest to distinguish in the coding, was practically the same as in the present study. The proportion of our sample who came from Social Group I was greater than in the Gesser and Fasth data, and the middle category was correspondingly smaller. These differences can partly be explained by possible slight coding errors and the varying social composition within the respective school programs from one year to the next.

ANNEX

Variables used in the Analyses

Name	Codes	Definition
SES	1	Social Group III: working class
	2	Social Group II: middle and lower-middle class
	3	Social Group I: upper and upper middle class
		The variable is based on Father's occupation as reported by the students themselves. The original IEA scale on Father's occupation consisted of nine categories. (Husén et al., 1973).
TRACK	1	Humanities
	2	Social sciences
	3	Economic
	4	Science
	5	Technology
		The information on students' track membership was obtained directly from the records of each gymnasium school.
PROGRAM	1	Semi-vocational: Students enrolled in Economic and Technology tracks (3 and 5) combined.
	2	Academic: Humanities, Social Science and Science tracks (1, 2 and 4) combined.
PARENTAL ENCOURAGEMENT	1-3	The variable, designed as a 3 point scale, was derived from the following IEA-items:
		(i)"In your spare time at home, do your parents . encourage you to read as much possible? . sometimes suggest you read? . not mind if you never read?"
		(ii)"When you get home from school, do your parents . always or almost always want to know how you have done? . sometimes ask about your schoolwork? . never or almost never ask about your school work?"
GRADES	1.0-5.0	The Grade-Point-Average for each student of the sample, when graduating from the third year of the Gymnasium, has been obtained from the Central Bureau of Statistics. The variable constitutes a continuous measure, in theory ranging from 1.0 to 5.0.

Name	Codes	Definition
READING FOR PLEASURE	1-3	The variable, designed as a 3 point scale, was derived from the following IEA-item: "About how many hours did you spend reading for your own pleasure last week? (not including comics) . 0 hours . less than 1 hour . between 1 and 2 hours . between 2 and 3 hours . more than 3 hours"
AMBITION	1-3	The variable, designed as a 3 point scale, was derived from the following two IEA-items: (i) "Important to do well in school" (agree/disagree) (ii) "Wish to get as much education as I can" (agree/disagree)
ONGOING	0-1	The criterion variable of the analyses in Chapter 5 has been labelled alternatively ONGOING alternatively university/college attendance. Individuals who have chosen not to go on or to attend universities and colleges have been coded 0. Accordingly, those who actually attended have got the code 1. A dichotomous criterion variable has also been used when analysing choice of program in higher education (see Chapter 6).

CHAPTER 5

TRANSITION TO HIGHER EDUCATION

5.1 Introduction

The decision to continue to higher education has traditionally been regarded as a choice of status in the sense that those who completed a university or college education could expect to enter the labor market at a somewhat higher occupational level than those who left the educational system after graduation from the gymnasium. One could say that a certain number of relatively well paid and certainly prestigious professions were reserved for the persons who were lucky enough to obtain higher education. This privileged situation may still remain for some of the professionally oriented courses with highly restricted intake, such as medicine and dentistry, but for many of the courses in the open admission sector, especially humanities and social sciences, the labor market prospects have changed after the enrollment explosion during the 1960's. (Further details are given in Chapter 6).

Those who at the end of the 1960's and the beginning of the 1970's entered the open admission faculties could only be sure that their final qualification would enable them to compete for the jobs which normally recruited from the traditional academic courses. Those who were less successful in this competition for jobs would probably have to search for positions which previously only attracted graduates from upper secondary schools. Compared with the situation during the 1950's and until the middle of the 1960's, there was now much more of a risk involved in the choice of study after graduation from the gymnasium. This is one of the reasons why it may still be of interest to consider what those who decided to continue to higher education had in common, or to put it in a slightly different way, to study what conditions or factors differentiated between those who attended universities/university colleges and other gymnasium graduates.

The operational definition of participation in higher education used in the present study is that the student should have obtained a credit of at least one point in a course at a university or university college. This is in accordance with the practice established by the National Board of Universities and Colleges (UKÄ, 1974). Enrolling in higher education without taking any courses was particularly prevalent in the open admission faculties, i.e., the faculties of Theology, Humanities, Social Sciences and Science. We have been able to differentiate between active and passive students only

in these faculties due to the limitations of the data from the register of the Central Bureau of Statistics (SCB). For the other faculties, participants in higher education were identified solely through enrollment records.

Before presenting the findings from our Multiple Classification Analysis (MCA), we shall describe the transition to higher education with respect to some of the basic factors which are usually reported in public surveys and statistics, i.e., student's sex, track membership, grades and SES.[1] Comparisons will be made between on the one hand, those secondary school students who have enrolled in higher education, and on the other hand, those who have chosen to enter the labor market directly or via some type of vocational education on a lower theoretical level.

5.2 Transition Rates in Relation to Sex and Gymnasium Track

During the period of investigation, 44 per cent of the sample went to university and college - 39 per cent of female graduates and 48 per cent of the males. As expected, the proportion continuing to higher education was considerably larger for graduates from the academic tracks than from the semi-vocational tracks. It was particularly small among male students in technology and the females in economic subjects respectively.

Table 5.1 Rates of Transition from Gymnasium to Universities and Colleges. Distribution by Sex and Track.

TRACK	Humanities	Social Sciences	Economics	Science	Technology	All	n
Females	45	42	19	47	-	39	(259)
Males	63	56	41	66	23	48	(399)
All	47	48	30	60	23	44	(658)

5.3 Transition Rates in Relation to Grades

The association between average Grades and enrollment in higher education is extremely pronounced. Out of the approximate two-thirds of students who belonged to the lowest grade category (called the "low-medium" group), less than one-third continued, compared to 84 per cent among those with the highest Grades. Among the high achieving students, the differences in transition rates were as large for girls as they were for boys. In terms of program, almost all of the high achieving students from the Science track continued, while this was true for about three-quarters of those from the Economic and Technology tracks. Girls of the Economic track constituted the largest

'reserve of talent' - only half of the high achievers continued to higher education. Further details are given in Appendix B.1-2.

Table 5.2 Rates of Transition from Gymnasium to Universities and Colleges. Distribution by Sex and Grade.

GRADES	Low (2.3-3.4)	(3.5-3.9)	High (4.0-5.0)	All	n
Females	26	44	84	39	(259)
Males	35	59	84	48	(399)
All	31	52	84	44	(658)

5.4 Transition Rates: Social Background

The well known relationship between social class and educational and occupational aspirations is also reflected in our data. The main dividing line runs between young people from Social Group I and other groups. This dichotomisation is most evident among the female students. Students from Social

Table 5.3 Rates of Transition from Gymnasium to Universities and Colleges. Distribution by Socioeconomic Background and Sex.

SES	Low III	II	High I	All	n
Females	30	35	55	39	(259)
Males	40	47	58	48	(399)
All	36	41	57	44	(658)

Group I constituted 27 per cent of the total gymnasium group and 35 per cent of those enrolled in universities and university colleges. The corresponding figures for students from working-class homes were 28 per cent and 22 per cent respectively. Twenty-four per cent of those who enrolled in higher education were of working class origin. The corresponding figure for females was 21 per cent (Appendix B.3). One may get an idea of the validity of these figures by comparing them with some recently published results of two longitudinal projects (Svensson, 1979). The individuals of the two samples were born in 1948 and 1953 respectively, while the majority of the students in our own sample were born in 1951. Working class students of the first sample constituted 24 per cent - males 25 per cent and females 23 per cent - of those who enrolled in higher education between 1966 and 1974. For the 1953 sample

(enrollment data from 1972 to 1976), their proportion had declined to 21 per cent - males 21 per cent and females 20 per cent.(2)

To summarize, the ranking with regard to combinations of Sex and SES was as follows: Girls (III)<Girls (II)<Boys (III)<Boys (II)<Girls (1)<Boys (1). For the two extremes, boys from Social Group I and girls from Social Group III: the transition rates were 58 and 30 per cent respectively. The differences in educational choice between the highest social category and the others concerned mainly the low achieving students. (Appendix B.4-5).

5.5 Multiple Classification Analysis (MCA) of Enrollment in Higher Education

The results of the first set of Multiple Classification Analysis (MCA) have been summarized in Table 5.4. The relationship between the criterion variable Ongoing and each independent variable, or predictor, is stated there.(3) The eta coefficient is an estimate of each predictor's capacity to explain the variance in the dependent variable without considering the effect of the other independent variables. Beta, on the other hand, expresses the contribution of each independent variable to the explanation of the variance, i.e., once adjustment has been made for the influence of the other predictors. The former coefficient is comparable with the simple correlation coefficient and beta with the standardized regression coefficient. Andrews (1973, p.47) warns expressly against interpreting the beta coefficient in any other manner, in particular to regard the squared values as a measurement of the proportion of variance explained. Such an interpretation is only defendible when all the predictors are uncorrelated, i.e., in a situation where there would be no need for an MCA analysis. The MCA also provides an estimate of the squared multiple correlation coefficient (R^2) which tells us the total amount of variance explained by the variables of the model. The coefficient used, R^2 adjusted, has been adjusted for the number of degrees of freedom.(4)

It should be emphasized that the purpose of the MCA is exploratory and is used to describe the sample. Consequently, the results are sometimes interpreted without formal statistical rigor. For instance, when the whole sample is included, significant associations between the predictors and the criterion may be obtained even when the absolute size of the coefficients is rather low. On the other hand, in some analyses on relatively small subgroups, the values of the coefficients may be high but not significant.(5)

The MCAs have been supplemented by intercorrelations and cross-tabular analyses to illustrate the associations between the predictors. (See also Appendix B.1-5).

5.6 Findings from an Overall Analysis of the Sample

Table 5.4 shows that previous achievement (Grades) and earlier choice of studies (Program) have definitely had the greatest influence upon the decision to continue studying. This applies to both male and female students. These strong associations are not unexpected with regard to the highly varied requirements for admission to the different forms of higher education, reflected in the criterion Ongoing.

Another fact which appears throughout is that the direct effect of Parental Encouragement is insignificant in this choice. This applies to both male and female students regardless of whether the course completed was in Technology/Science or in the Humanities/Social Sciences. The importance

Table 5.4 MCA Summary: Choice of University or College Attendance (1) versus Non-Attendance (0) by Sex

	Males	Females
R (adjusted)	.56	.49
R^2 (adjusted)	.31	.24
Eta Coefficients		
SES	.15	.20
Program	.34	.22
Parental Encouragement	.11	.12
Grades	.42	.42
Reading for Pleasure	.17	.16
Ambition	.22	.17
Beta Coefficients		
SES	.06	.10
Program	.29	.14
Parental Encouragement	.06	.06
Grades	.36	.36
Reading for Pleasure	.11	.08
Ambition	.13	.08
Grand Mean (Ongoing)	0.48	0.39
Sample Size (n)	(798)	(647)

Underlined beta coefficients are significant at the .05 level.

of the social status of the home differs between males and females. The simple correlation between SES and Ongoing is higher among females and when we keep constant for the effect of the other variables the influence of SES remains.

The other difference between male and female students as regards the pattern of transition concerns the effect of the study program in secondary school. Both the eta values and the beta values are here substantially higher for males. One might quite rightly object that the comparison is not fair, as the females are not represented among the students of the Technology track. It is from this track that the proportion of students continuing to higher education was by far the lowest. Furthermore, it is clear that the analysis should be supplemented by a study of the pattern of transition with regard to subjects studied or content of the gymnasium program. The beta values were markedly lower than the corresponding eta values, with the exception of the variable Program which indicates that the correlations between the predictors were important.

5.7 The Effect of Choice of Science vs. Non-Science Curriculum in the Gymnasium

This section compares the educational choice of students who have followed a science curriculum in the gymnasium (Science or Technology track) with that of those having a humanities/social science background (Humanities, Social Sciences or Economic track). Since there were no female students in the Technology track, we have preferred to focus our analysis of science and technology students ("science sector") on males only.

As can be seen in Table 5.5, male students from the science sector of the gymnasium differed considerably from their peers attending other courses. Students are recruited for the prestigious courses requiring high grades for admission from the science sector group. Consequently, the average Grade plays an important role in the heterogeneous group being studied here. The high values, both eta and beta, obtained for Program, can be largely attributed to the fact that students from the Technology track continue much less frequently than other gymnasium students. After having taken into consideration these two factors, the effect of home environment, ambition or interest are of no direct importance for Ongoing. This was naturally to be expected.

A study of graduates with a humanities/social science background is of greater interest. As expected, the number of students with top grades was considerably smaller in this group compared to those coming from the Science track. This must be seen in relation to the fact that without a supplementary examination in science subjects, the number of courses with highly restricted intake that are directly available to this group is very small. It is, in effect, only the Stockholm School of Economics and Business Administration and the psychology program (only during the first two terms after the grad-

uation of the group in question) that have had high entrance requirements in terms of grades. There were also some more vocationally oriented courses with less restricted intake, e.g., colleges of social work and public administration.

Table 5.5 MCA Summary: Choice of University or College Attendance (1) versus Non-Attendance (0). Distribution by Curriculum in Gymnasium.

	Male Graduates of Science and Technology Tracks	Male Graduates of Humanities, Social Sciences and Economic Tracks	Female Graduates of Humanities, Social Sciences and Economic Tracks
R (adjusted)	.63	.49	.47
R^2 (adjusted)	.40	.24	.22
Eta Coefficients			
SES	.17	.12	.20
Program	.43	.18	.23
Parental Encouragement	.11	.10	.10
Grades	.48	.33	.38
Reading for Pleasure	.11	.29	.20
Ambition	.18	.29	.15
Beta Coefficients			
SES	.05	.10	.11
Program	.38	.16	.15
Parental Encouragement	.07	.08	.04
Grades	.42	.25	.33
Reading for Pleasure	.08	.20	.11
Ambition	.07	.22	.07
Grand Mean (Ongoing)	0.47	0.49	0.37
Sample Size (n)	(501)	(297)	(516)

Underlined beta coefficients are significant at the .05 level.

As far as the male students are concerned, the effect of Grades and study Program appears to be considerably lower here than in the science-technology group. At the same time the importance of factors other than achievement and earlier choice of studies is apparent. In the case of the female students, however, the grade factor appears to have been by far the most important. It is clear that the likelihood of boys from the humanities/social science sector continuing studies is associated with higher ambitions as well as intellectual orientation. On the other hand, it seems that home background and parental support still have no direct effect upon enrollment in higher education, i.e., after consideration has been given to the other variables. It appears, as far as the female students are concerned, that

Ambition and Reading for Pleasure have had a considerably smaller effect than in the case of their male counterparts. It should also be noted that the number of males from the semi-vocational Economic track within this group was relatively small compared to the proportion of males of the Technology track within the science sector. Against this background it is natural that factors other than achievement have been of importance in the decision to continue to higher education.

The model explains a larger share of the variance of Ongoing for men than for women - 31 compared to 24 per cent. The difference, however, was insignificant among graduates with a humanities/social science background (24 per cent for the men, 22 per cent for the women). The predictive power of the model was highest for the graduates from the science sector, for whom R^2 of 0.40 was obtained. As was indicated earlier, this could be attributed to the strong influence of Grades and whether they were enrolled in an academic track or not.

5.8 Analysis at the Level of Track Chosen

The comparison between the sectors, and between the different gymnasium tracks (Table 5.6), clarifies the picture on two important points. In the first place there is great consistency in the results for the academically oriented tracks, regardless of combination of subjects. This is the case if we regard those factors which have been of importance for Ongoing, and disregard the fact that the value of the beta coefficient was so much higher for the science students. Besides Grades, intrinsic interest has been of importance for men of the Humanities and Social Science tracks and also of the Science track. For the corresponding female students, Grades alone were important. Sizeable differences within the humanities/social science sector were identified as a result of the division into tracks. It is thus clear that Ambition has been of importance for students from the Economic track, whereas intrinsic interest in learning only applies to students from the Humanities and Social Science tracks. In the same way, it appears that among the female students the influence of the home background applies primarily to those who have completed the Economic track.(6)

5.9 Analysis of the Low-Medium Group

As has been mentioned earlier, the requirements for admission to different studies serve as a rough indication of the stratification which has taken place within higher education since the enrollment explosion got fully under-

Table 5.6 MCA Summary: Choice of University or College Attendance (1) versus Non-Attendance (0) Distribution by Gymnasium Track.

	Male Graduates of Science Track	Female Graduates of Science Track	Male Graduates of Technology Track	Male Graduates of Humanities and Social Science Tracks	Female Graduates of Humanities and Social Science Tracks	Male Graduates of Economic Track	Female Graduates of Economic Track
R (adjusted)	.51	.58	.55	.39	.44	.56	.46
R^2 (adjusted)	.26	.33	.30	.15	.19	.32	.21
Eta Coefficients							
SES	.10	.25	.10	.13	.16	.06	.27
Parental Encouragement	.13	.19	.12	.09	.13	-.15	-.08
Grades	.48	.52	.52	.29	.38	.39	.29
Reading for Pleasure	.13	.07	.05	.28	.20	.30	.19
Ambition	.17	.26	.21	.21	.16	.39	.10
Beta Coefficients							
SES	.04	.14	.11	.11	.06	.09	.30
Parental Encouragement	.07	.14	.11	.05	.08	-.14	-.10
Grades	.45	.47	.49	.19	.35	.33	.27
Reading for Pleasure	.14	.09	.04	.23	.10	.18	.20
Ambition	.08	.11	.10	.15	.08	.31	.04
Grand Mean (Ongoing)	0.66	0.47	0.22	0.57	0.44	0.39	0.19
Sample Size (n)	(283)	(131)	(218)	(164)	(378)	(133)	(138)

Underlined beta coefficients are significant at the .05 level.

way at the beginning of the 1960's. For this reason, graduates whose grades were not sufficient for admission to a university or university college course with restricted intake constituted a particular category. This category has been termed "low-medium" and includes practically two-thirds of the total group being investigated (64 per cent of the men and 66 per cent of the women).

The composition of the low-medium group differs on some points from that of the entire group. It consists of a relatively smaller number of students from the Science track (56 per cent of the females and 61 per cent of the males from this track belonged to the low-medium group). In the same way, the proportion of students of the Economic track was larger than in the entire group (67 and 75 per cent respectively). This has, therefore, had the effect of a certain under-representation in the low-medium group of the highest socioeconomic category.

The transition rate is 44 per cent for the whole sample as compared to 34 per cent for the low-medium group. As one could expect, this difference occurs primarily among students from the science sector.

Table 5.7 shows that the difference between the eta and beta coefficients is not nearly as large as in the more heterogeneous group. Parental Encouragement constitutes the exception: its association with Ongoing becomes considerably lower and is in all cases insignificant when the effect of other variables is allowed for. Tendencies toward differences between the three main categories as regards the influence of home background and the attitude of the students themselves that earlier were only barely perceptible, emerge clearly in the low-medium group. It is evident, in the case of the females, that the social position of the home has had a strong and direct effect upon the decision to enroll in higher education. As far as the males were concerned, this association is slight or nonexistent. Aspirations and intrinsic interest are of extreme importance among male graduates from the Humanities and Social Science tracks, as opposed to other groups. Furthermore, the influence of grades is considerably larger.

The proportion of explained variance is much lower in the subsample of low-medium students for two of the three categories, as compared to the whole sample. Singling out the low-medium group resulted in the R^2 value being practically reduced by half for females in the humanities/social science group (13 per cent). The explained variance also decreased considerably for males from the science sector (from 40 to 28 per cent). For the remaining group, men with a humanities/social science background, the predicted R^2

value was absolutely identical to the value obtained for the whole sample.

Table 5.7 MCA Summary: Choice of University or College Attendance (1) versus Non-Attendance (0). Graduates of Low-Medium Group.

	Males	Females
R (adjusted)	.48	.35
R^2 (adjusted)	.23	.12
Eta Coefficients		
SES	.09	.21
Program	.34	.16
Parental Encouragement	.15	.11
Grades	.26	.19
Reading for Pleasure	.18	.14
Ambition	.19	.09
Beta Coefficients		
SES	.06	.19
Program	.32	.15
Parental Encouragement	.08	.05
Grades	.22	.16
Reading for Pleasure	.15	.11
Ambition	.14	.07
Grand Mean (Ongoing)	0.35	0.29
Sample Size (n)	(514)	(428)

Underlined beta coefficients are significant at the .05 level.

5.10 Intercorrelations between the Predictors

The outcome of the MCAs will here be supplemented by an inspection of the intercorrelations between the independent variables.(7) This is necessary for a better understanding of the phenomena which the model of analysis attempts to describe. See Tables B.6-B.9.

Among the male students the intercorrelations in the whole sample and the low-medium group were roughly the same. There were no (or only weak) positive correlations between Socioeconomic Status and the other independent variables. One clear association could, however, be noted: The probability that students of the academically oriented gymnasium tracks would come from the highest socioeconomic group was considerably higher than their coming from a working class home. The reverse was true for the semi-vocational tracks. Moreover, there was a tendency, though not as pronounced as the above mentioned one, that the higher the socioeconomic background of the students, the more often had they experienced encouragement from their parents. One could, therefore, expect the students of the academic tracks to have experienced Parental Encouragement more often, which in effect proved to be the case.

There was a positive correlation between Parental Encouragement and Reading for Pleasure, but the correlation between Parental Encouragement and Ambition was even higher. In both the whole sample and the low-medium group, the relationship between SES and Grades was relatively low. On the other hand, there was a strong association between Ambition and Grades, as strong as that between Ambition and Ongoing. In the subgroup of men from the Economic track, Ambition and Reading for Pleasure seemed to be relatively highly correlated.

Among the women, there was a strong positive correlation between SES and Grades, as strong as that between SES and Ongoing. Furthermore, the encouragement of the parents seemed to stimulate their children to read during their spare time and to influence their level of aspiration as well. As in the case of the male students, Ambition was clearly related to Grades, but there was also a positive correlation between Grades and Reading for Pleasure.

The overall results which have so far been reported, conceal some important differences between different tracks. Among both males and females there was a marked difference between the semi-vocational tracks and the academic tracks. In the case of the latter, there were positive correlations between SES and Ongoing, as well as between SES and Grades. These tracks were also the ones that attracted the largest number of students from the highest socioeconomic group, and which ultimately showed the highest transition rates to universities and university colleges.

Within the vocationally oriented tracks, the composition of which is the least biased socioeconomically, there was a slightly negative correlation between SES and Grades and no correlation at all between SES and Ongoing. This may indicate that the students of upper class homes enrolled in these tracks were markedly low achievers. The females from the Economic track constituted an exception: here the correlation between SES and Ongoing was relatively high.

Previously, we were able to state that Parental Encouragement was associated both with Ambition and Reading for Pleasure. However, men from the Economic track differed from the others. Instead, there was here a strong correlation between Ambition and Reading for Pleasure. The same tendency, though less pronounced, existed among the women from the Economic track.(8)

5.11 Summary and Discussion

This chapter has dealt with the recruitment to traditional forms of university and university college education (regardless of content) which all have the entrance requirements of a completed three-year course at the upper secondary school. We have attempted to take into account the fact that the objective opportunities to make a choice between different courses within higher education varied considerably within the group under study. Therefore, the meaning of continuing to higher education has been experienced differently by the students in the sample. Thus, consideration has been given to whether the students had:

- completed a science-based curriculum or not;
- enrolled in an academically oriented secondary school track or not; and
- had opportunities to be admitted to courses with restricted intake or not.

The global result showed that the transition rates were higher for men than for women, higher for students from the highest socioeconomic group than for their classmates from working-class homes, and higher for those who had completed an academic track.

The analyses based on simple correlation demonstrated that each variable included in the model had a positive correlation with Ongoing to higher education. When we subsequently considered the simultaneous influence of the other independent variables of the model by means of the MCA, we found that achievement in secondary school, as measured by Grades obtained in the terminal class, and type of Program taken in the gymnasium, had been of considerable importance throughout the analysis for the decision to enroll in higher education. This was true for the whole sample as well as in the low-medium group, among males as well as among females.

Both Ambition and Reading for Pleasure were positively and significantly related to Ongoing. Their contribution to the amount of variance explained was modest when looking at the entire sample, but very considerable in the case of certain subgroups. Ambition was strongly correlated to Grades and had an effect on Ongoing only in the case of male graduates. With the exception for females of the Economics track, the importance of Reading for Pleasure in predicting enrollment in higher education was limited to graduates of the academic tracks. The role of Ambition and Reading for Pleasure as differentiating factors between ongoers and other gymnasium graduates was most pronounced in the low-medium group or among men with a humanities-

social science background.

The effect of Parental Encouragement on Ongoing was very limited indeed. Its influence seems to have been of an indirect nature, but it does not appear on the whole to be an efficient mediator between the socioeconomic position of the home and the student's choice of post-secondary education.

When the influence of the other variables in the model on educational choice was taken into consideration, the relationship between SES and the criterion remained significant only among females. A special analysis of this phenomenon showed that the difference was mainly due to the effect of Program (see Appendix B.15). When only the previous achievement of the students (Grades) was controlled for, the importance of their home background diminished somewhat, but was still considerable among both men and women. When, in addition, the influence of program chosen in the gymnasium was considered, the effect of SES on enrollment in higher education disappeared completely among male students. Here, two things should be kept in mind. In the first place, students of the lower social categories tended to be concentrated in the more vocationally oriented programs and, at the same time, the proportion of students enrolled in these programs was much higher in the case of the men of our sample (no women of our sample enrolled in the Technology track). In the second place, the association between Program and Grades was less pronounced among the male students as a whole. Two opposite trends emerged when we examined the different subgroups, i.e., at the track level.

At this stage, it is of some interest to compare our results with findings reported in other studies. Sewell and Shah (1967) analyzed college attendance among high school graduates in Wisconsin as explained by students' ability and socioeconomic status of the parents. For male graduates they found that ability was more influential than SES in predicting who would enter college. For females, on the contrary, differences in SES were more related to attendance than were differences in ability.

Duru (1978), in her follow-up study of a group of upper secondary school graduates in the Dijon area in France, showed that the track chosen in the upper secondary school was by far the most important predictor of continued studies at the university level. The other factors were, in order of importance, the age at which the baccalauréat was completed, geographical origin (the size of the community and distance from a university), and father's education. It is noteworthy that Grades seemed to have had a

relatively small measure of importance. This appears to be due to the small range in Grades that characterize those who succeed in the baccalauréat examination (a substantial portion fail each year). On the other hand, achievement is also reflected in the variable age at which the baccalauréat is completed. By contrast with Sweden, it is fairly frequent that French students repeat a grade or two during their schooling and also sit for the baccalauréat several times.

Gesser (1968) compared the effects of basic factors like Sex, SES and Grades (Grade-point-average) at two distinct stages of the institutionalized selection process in the Swedish educational system. He used Härnqvist and Grahm's (1963) study on a sample of 15-16 year-olds who graduated in 1960 from the academic stream of the lower secondary school (realskola)to analyze the selection to the upper secondary school (gymnasium). Gesser found Grades to be the most important factor, SES the next most important and Sex the least important factor in "explaining" whether the students had applied for gymnasium or not.(9)

The second study covered the transfer to higher education among students who graduated from upper secondary school in 1957. Results showed that the passage to universities and university colleges was primarily associated with Grades obtained in the matriculation examination and secondly with the Sex of the student, whereas the overall effect of SES, although noticeable in all subgroups, was insignificant. Gesser (1968, p.39) attributed the declining importance of the students' social background to the fact that the group of students eligible for higher education was already a selected one and that the transition rate to universities and university colleges was comparatively high. Even though application for admittance and enrollment are not exactly the same thing, and Gesser was the first to recognize this, the comparison is interesting. All the analyses reported in the present study were carried out for male and female students separately, but to follow up the analysis made by Gesser we have made one exception to this principle. As expected, Grades were so far the most influential factor in the students' decision to continue to higher education. However, unlike the result reported by Gesser, there was no difference here between Sex and SES, and the effect of both was significant. Adding Program to the other factors resulted in the following rating: 1) Grades, 2) Program, 3) Sex and 4) SES. The values of the coefficients on these analyses are given in Appendix B.14.(10)

Behind the fact that in the analysis of the entire sample Grades had

by far the greatest influence on enrollment in higher education, there are several different phenomena which should be taken into consideration. Let us first illustrate this by a comparison with the situation in the earlier transition, i.e., that taking place after the completion of the comprehensive school (grundskola). Around 1970, only approximately 30 per cent of those who completed the comprehensive school could be guaranteed a place in the long gymnasium tracks which qualified them for higher education. At the same time, practically everybody who had completed the three-year gymnasium was eligible for some form of higher education. That not everyone continued to higher education would then be a case of self-selection rather than anything else. Here we are faced with the obvious fact that higher education is not a uniform concept. Previously, it was estimated that about one third of the sample, regardless of subjects taken in gymnasium, were in a position to compete with success for entrance to courses with restricted admission. This is not to say that everybody took advantage of the opportunity. But, for these individuals, the Grades could have served a direct purpose for access to a particular course. The interesting thing is that among the two thirds who, theoretically speaking, could not gain entrance to restricted courses - even though we should expect that some of the marginal cases would have applied for such courses - Grades played a prominent role in the decision to continue to higher education. Grades are, therefore, likely to have served as an indicator of students' self-estimated ability.

To judge from the results of the MCA and the intercorrelations, it seems that the predicted patterns found differed to a certain extent from our expectations as spelled out in detail in Chapter 3. However, for the group with a humanities/social science background, especially the male graduates, it is not unlikely that the influence of home background has been chanelled through more active parental support affecting the reading habits and tastes of the students and their aspirations (which were important determinants of the results obtained in school), which ultimately lead to different educational choices. Among science and technology graduates, the SES tended to have an effect only through Ambition and Grades.

As regard the specific analysis of the low-medium group, which was in a conceptual sense a more "pure" analysis, the elimination of those who had the opportunity of being accepted at courses with restricted intake meant that the importance of the attitudinal variables increased. In addition, the importance of having a "good" socioeconomic background became evident in the case of females with low Grades. The proportion of variance explained was considerably lower in the low-medium group than in the more heterogeneous

total group, especially when comparing categories for which the importance of Grades had been particularly pronounced, i.e., women in general, and students from the science sector. However, among men in the humanities/ social science group, the proportion of variance explained remained the same.

Finally, as regards the variable Reading for Pleasure, the differences found between students of different gymnasium tracks need further explanation. As expected, students of the academic tracks ranked higher than those enrolled in the semi-vocational tracks (when analyzing science and non-science programs separately). However, it is noteworthy that the students of the Science and Technology tracks taken together read less in their spare time than other students. There are at least two possible reasons for this: (i) our measure relates less to reading on a specific subject or topic than to reading about general issues, such as current social and economic problems in society or general cultural aspects; (ii) their workload is higher. We would conjecture that both are valid and that they are interrelated. The National Curriculum Plan for the gymnasium (Läroplan för gymnasiet, 1969) prescribes a) that the total workload shall be the same in all tracks and b) that the students shall have the opportunity to complete the major part of their asssignments at school. However, in reality things seem to be somewhat different.

According to a study published in 1974 on a sample of gymnasium students in Stockholm, the students of the Science track reported an average time spent at home on reading and school assignments that substantially exceeded that given by students of other tracks (Sjöberg, 1974). Students in the Technology track occupied the second place in this respect and, in addition, had the heaviest timetable of all tracks. Our tentative conclusion would be, then, that not only have students following science or technology curriculum had less time to spend on reading for pleasure, but also, and as a consequence of this, their teachers and parents encourage them less to undertake reading that would not be of immediate use in their studies, and ultimately be reflected in higher grades in a particular subject. It is also worth noting that the Stockholm Study (Sjöberg, 1974) also reported that for all tracks females devoted more time to assignments at home than boys.

Notes

1. It is only in recent years that data on social background of the students have been published by the Central Bureau of Statistics (SCB), 1976.

2. We have adjusted Svensson's (1979) results to facilitate the comparison, i.e., post-secondary studies of non-university type have been excluded.

3. A dichotomous variable may be considered as a special case of a continous variable (Boyle, 1966). When it is used as a dependent variable, the result may be interpreted as the probability of "Y" occuring given the values in the independent variables (see, for instance, Goldberger, 1964, p.243-51, who used the term "conditional probability function model"). Dichtomous dependent variables were often used in the Wisconsin Study.

4. There are certain conditions that have to be met in order to use statistical models such as MCA and multiple regression analysis. A major concern is the assumption of additivity, or that no interactions exist between the predictor variables. It is then desirable to test prior to the MCA whether this is in fact the case. The so-called "Automatic Interaction Detector" program (AID) of the OSIRIS package offers this possibility. For technical reasons we were not able to use this package. However, in addition to the estimates of the main effects of the variables in our analytical model, the MCA version of the SPSS package used provides estimates of interactions. We have then proceeded in the following way: once a significant interaction was identified, we tried to pin it down further by means of cross-tabulations.

5. A major reason for choosing a regression type of analysis, i.e., MCA is that it gives economy in presentation. In the analysis, SES, Parental Encouragement, Ambition, Reading for Pleasure and Program have been treated as factors and Grades as a covariate. Estimation and significance testing relate to the final step of the MCA in which the effect of all factors and the covariates upon the criterion variable Ongoing have been taken into account simultaneously.

6. It should, however, be noted that there is a certain degree of uncertainty surrounding this finding, due to the skewness of the criterion variable (19 per cent Ongoing, 81 per cent Non-Ongoing).

7. We are aware that most of the variables in the model do not fulfil the conditions required for the use of product-moment correlations. However, it seems that the errors arising when ordinal variables are used instead of equal interval ones are not too frightening. Once again, the choice of technique has been determined by our concern for parsimonious presentation of the general patterns.

8. Two interactions were detected, both applying to female students only, namely, in the first place between SES and Program in the analysis of all women of the sample. Secondly, between Parental Encouragement and Reading for Pleasure in the analysis of all female students and of the various subgroups. The cross tabulations did not show any consistent or meaningful pattern as regards the interaction between Parental Encouragement and Reading for Pleasure. In the first place, the interaction could be more easily isolated. Female students of the highest social category who had completed a semi-vocational program at upper secondary school exhibited quite different behavior from other students of the same program. There are in principle two different ways of handling interactions: either to split up the variables into subcategories, which happens automatically as regards Program when our analysis is carried out by sector (science versus non-science), or to include the interaction terms in the model. An interesting example of the latter alternative here is found in Fägerlind (1975). Our main interest here is to study the major effects in the model used. Since no meaningful pattern can be found as regards the interaction between

Parental Encouragement and Reading for Pleasure, and since simple additive models are more parsimonious than interactive ones, it was decided to use the same additive model throughout the analysis.

9. The technique used, originally developed by Coleman (1964), is based on average differences between categories within the independent variables. Average difference corresponds to the unweighted estimate of effect in the multivariate analysis of attributes.

10. A significant interaction for Sex and Program was found.

CHAPTER 6

CHOICE OF PROGRAM IN HIGHER EDUCATION

6.1 Introduction

After two decades of continuous expansion, enrollments at universities and colleges in Sweden suddenly levelled off in 1969. The reasons behind this change are multiple, and only a few observations will be made as an introduction to what is the major focus of the present chapter, namely the increasing stratification within Swedish higher education.

A factor that certainly contributes directly to the lower enrollment figures, but which was seldom mentioned in the public debate at the time, was the absolute and relative decrease in the number of students who completed studies in upper secondary school tracks qualifying for entrance to higher education (Härnquist, 1978). More attention was given to the labor market prospects for those with a university training. The priveleged labor market situation which prevailed in the early 1950's and which had benefited all graduates of higher education, was at the end of the 1960's limited to certain types of programs only (Gesser, 1971). During the whole period, competition for entrance to programs with restricted intake became increasingly stiffer. Rates of return studies (Magnusson and Tychsen, 1972; Ståhl, 1974) based on data from the period 1960 to 1968 showed that studies could lead to considerable differences in income development for graduates of different types of higher education. The approximately 120,000 university graduates who were to be found on the labor market in 1968 had increased to 170,000 by 1973, a period during which expansion of demand for qualified manpower on the part of the public sector began to slow down (Ståhl, 1974).

The changing conditions brought about an increased stratification within the system of higher education. In his study of recruitment to higher education, Gesser (1971) distinguished between four levels where further studies tend to lead to professions yielding higher income and prestige than do studies at a lower level. The four educational levels were: (a) "prestige" studies, (b) studies in the arts and science faculties, (c) other types of higher education (social work, physiotherapy and gymnastics teacher training), and (d) certain types of post-secondary education other than universities (the most important here was primary school teacher training). This classification was applied to students enrolled between 1962/63 and 1968/69. Following the reduction of inequalities which took place during that period, in categories a and b above, Gesser (1971) concluded that one could, from

then on, work with three levels whereas the two middle categories could be merged into one. The results of comparisons between educational programs at all three levels are presented in the present chapter. The first category is represented by law, economics-business administration, and engineering (Institutes of Technology). These studies are contrasted with enrollment in humanities, the social sciences, and sciences (category b). The last analysis focussed on choice of teacher training (category c) instead of the category b alternatives mentioned above.

Gesser (1971) has indicated three dimensions in terms of which different types of study in higher education can be described: the social composition of the group, income expected after graduation and the length of the course. The mimimum stipulated study time for courses in the prestige category is seven semesters. Included among prestige or high status studies are the following: law, economics, engineering, agronomy, forestry, veterinary science, medicine, dentistry, pharmacy, and psychology. Studies at the doctoral level (studies leading to a Ph.D.) could also be included in the prestige category (Gesser, 1968).

This classification, however, reflects the situation in the late 1960's and fluctuates over time. Competition for places in these fields reflects the expectations which students hold concerning their utility on the labor market. It should be mentioned that all of these courses, with the exception of law, were subject to numerus clausus. In the late 1960's, admission requirements for most courses at the Institutes of Technology were lowered as the number of places increased. Later, the same trend occurred in psychology. Furthermore, from the late 1960's on it was possible to enroll for the same type of course in economics in the unrestricted Faculty of Social Science as had formerly been available only at the Schools of Economics and Business Administration.

The third criterion used by Gesser (1971) to distinguish between different levels of higher education, and one on which his own research focussed, concerned the social composition of the students enrolled. The expansion of enrollment at universities and colleges during the period 1956 to 1969 resulted in an increase in both absolute and relative numbers of students from working-class homes. However, recruitment to prestige studies also proved to be just as biased in relation to the social background of the students as it had been for the entire higher education sector fifteen years earlier (Gesser, 1971). Women were also under-represented in this elite group.

If the number of graduates from higher education increases, but with-

out a corresponding increase in employment opportunities, a certain number of these university-trained people are likely to be found at levels previously occupied by those with only secondary schooling. This applies not only to graduates from unrestricted "non-prestige education". Moreover, the risk of unemployment has become increasingly real for graduates in many different fields. The latter aspect should also be considered in relation to the rigidity which characterizes salary structures, especially for university-trained people (see, for example, Rydh and Österberg, 1971; Ståhl, 1974). One professional group may, for instance, have a very high salary level in relation to other groups, while unemployment within this group is also relatively high. Lawyers, economists, architects, and engineers had considerably higher salaries on the average during the 1960's than, for example, veterinarians, forest engineers and agronomists. On the other hand, the number of places available in courses related to the latter three forms of study was probably more strictly adjusted to demand on the labor market. Therefore, these professional groups are likely to have greater job security, at least in the short term. An additional factor is their degree of interchangeability on the labor market, which is likely to be much lower than that of economists.

In some cases prestige study is associated with sex differences in income and employment. However, in the case of doctors, dentists and lawyers, there are very small differences or none at all. Ståhl's study (1974, p.45) showed that sex differences as regards rate of return of investment in education were rather insignificant in those academic professions which are dominated by women, i.e., graduates of the Faculty of Humanities and of the School of Social Work and Public Administration, and largest in typically male professions, such as engineering and economics. The basis for these calculations is somewhat questionable and the value which analyses of this kind have for decisions regarding investment in different courses of study, both from the individual's and society's point of view, has therefore been debated a great deal among social scientists (see, among others, SOU, 1973; Abrahamson, 1975; Ekehammar, 1976).

We have already discussed changes which occurred within the prestige category since the data collection took place (Mählck and Mattsson, 1975). Some shifts occurred in other types of study as well. For example, it became more difficult to gain entrance to teacher training colleges. Furthermore, students with a general social science education tended to meet serious competition on the labor market from social work graduates. As indicated above, the aspect of job security should, therefore, be added to that of

prestige and average expected income. In Gesser and Fasth's (1973) follow-up study, the most important factors influencing occupational choice proved to be getting a job in the profession chosen as well as interest in the profession. Status and income ranked lower, but were higher for men than for women. Motives for choices and the degree of determination among university students may vary widely with subject category. One interesting example has been given by Elgquist-Saltzman (1970) who found that almost 100 per cent of the new economics students at the University of Umeå intended to complete their degree. This is in marked contrast to the intentions of students taking courses in education: one-third of these were studying "while waiting for something else", and many were later found in other types of study, often more vocationally-oriented. Findings from a series of Swedish studies are to be found in Fransson (1975) and Härnqvist (1978).

This introductory discussion to choice of program has dealt mainly with anticipatory conditions related to labor market prospects, expected life income and degree of selectivity in different parts of higher education. We are conscious that the references given are far from exhaustive (the present author is not an economist by profession). We would, however, like to sum up the discussion, and hopefully to add another element to our understanding of the mechanisms involved, by briefly describing a comprehensive model on choice of program in higher education developed by the French economist Mingat (1977). The model is based on the human capital theory but also includes some sociological aspects. According to the model, to make a rational decision the student will have to consider two types of risk. One type relates to the situation of the labor market and the risks of unemployment associated with different professions. Secondly, the individual and his family should consider the risk of study failure. Mingat (1977) found a negative correlation between the level of difficulty of a certain study alternative and its monetary rate of return. Another interesting feature of Mingat's model (1977) is that it postulates that the substitution rate, i.e., profitability/risk, varies according to the socioeconomic background of the student (cf. Boudon, 1973). This can be illustrated by Bourdieu's (1974) distinction between "stratégies de spéculateur" (maximization of gains) and "stratégies de rentier" (maximized security). Privilegded students may thus more often take a chance and apply for a selective type of course or enroll in difficult courses with a low likelihood of success and be prepared to change again, adopting a second strategy.

The question of study failure cannot be seen in isolation from the kind of selection practised in a particular system. Studies in medicine

constitute a classical example in the French system where there is no selection at the commencement of the study, but where the majority of those enrolled are deliberately screened out of the program at a later stage. In Sweden entry to the medical faculty is highly selective, whereas drop-out among those admitted is practically non-existent.

There are several problems involved with estimating rate of failure or success, in particular in the non-professional courses, if data on the aims and motives of students in undertaking these studies are not available. The conceptual and technical problems involved probably explain why to our knowledge, no studies have been undertaken in Sweden using risk of study failure or level of difficulty as a factor to explain differences in individual demand or choice (cf. Attehag and Svanfeldt, 1971).

6.2 Overview of Choice of Program among Students of the Sample

Table 6.1 summarizes the choices made by the students at the time of their first enrollment over the period from autumn term of 1970 to the autumn term of 1972. It can be seen that the choices follow fairly closely those made at the gymnasium. Graduates of the Humanities track have primarily chosen studies at the Faculty of Humanities at the universities. More than 40 per cent of the female and half of the male students enrolled in this faculty. The men had in the second place opted for studies in law, whereas teacher training had attracted many of the female students. A similar pattern was found for the graduates of the Social Science track, that is, university studies in the social sciences ranked highest amongst these students. It should be noted that studies in economics and business administration are organized at the Faculty of Social Sciences (with the exception of the Stockholm School of Economics and Business Administration) and that this program has been singled out for the purposes of our analysis. The highest transition rates, as well as the largest spread in choices, were displayed by those who graduated from the Science track. It is noteworthy that teacher training was the most frequently chosen program among women, followed by studies in social sciences. The men enrolled primarily in the Faculty of Science and in engineering (Institute of Technology). Almost 8 out of 10 male graduates from the Economic track who continued their studies had enrolled in economics and business administration. The choices undertaken by the women were more varied. The highest proportion amongst the ongoers were found in economics and business administration and in the social sciences. The comparatively few students of the Technology track who continued had also concentrated their choice on one particular program, engineering.

Table 6.1 Choice of Program in Higher Education. Distribution by Gymnasium Track.

Track	MALES						
	Humanities	Social Sciences	Economics	Science	Technology	All	n
Faculty of Humanities (including Theology)	29 50	43 18	6 4	23 4	0 0	9	(35)
Faculty of Social Sciences (excluding Economics/Business Administration)	4 10	41 26	8 7	45 12	2 2	13	(51)
Economics/Business Administration	2 10	16 16	46 67	23 10	12 19	20	(82)
Stockholm's School of Economics/ Business Administration	0 0	33 4	67 11	0 0	0 0	2	(9)
Faculty of Law	15 25	58 23	9 5	15 3	3 2	8	(33)
Faculty of Science	0 0	2 1	0 0	95 31	3 4	16	(63)
School of Social Work and Public Administration	0 0	58 9	25 5	17 1	0 0	3	(12)
Institute of Technology	0 0	0 0	0 0	57 25	43 71	21	(85)
Science Oriented Programs with Restricted Intake(1)	0 0	0 0	0 0	96 12	4 2	6	(25)
Colleges of Physical Education/ Journalism	0 0	25 1	25 2	50 1	0 0	1	(4)
Teacher Training	14 5	29 2	0 0	57 2	0 0	2	(7)
All n	5 (20)	20 (82)	14 (57)	48 (195)	13 (52)	100	(406)

(1) Medicine, Veterinary, Agronomy, Odontology, Forestry, Pharmacy.

Table 6.1 (Continued) Choice of Program in Higher Education. Distribution by Gymnasium Track.

Track	FEMALES Humanities	Social Sciences	Economics	Science	All	n
Faculty of Humanities (including Theology)	63 41	20 17	6 17	11 11	25	(81)
Faculty of Social Sciences (excluding Economics/Business Administration)	29 12	49 27	14 24	8 5	15	(51)
Economics/Business Administration	19 4	41 12	33 31	7 2	8	(27)
Stockholm's School of Economics/ Business Administration	0 0	67 2	33 3	0 0	1	(3)
Faculty of Law	67 11	19 4	5 3	9 2	6	(21)
Faculty of Science	0 0	0 0	0 0	100 19	5	(16)
School of Social Work and Public Administration	37 9	37 12	13 14	13 5	9	(30)
Institute of Technology	0 0	10 1	0 0	90 10	3	(10)
Science Oriented Programs with Restricted Intake(1)	20 0	0 0	0 0	80 10	3	(10)
College of Physical Education/ Journalism	0 0	30 3	0 0	70 8	3	(10)
Teacher Training	36 21	29 22	3 7	32 27	22	(72)
All	38	28	9	25	100	
n	(124)	(94)	(29)	(84)		(331)

(1) Medicine, Veterinary, Agronomy, Odontology, Forestry, Pharmacy.

A follow-up study conducted by the Central Bureau of Statistics (SCB, 1972) reported the educational or occupational activities ten months after graduation of a sample of 25 per cent of those who left upper secondary school in the spring of 1970. Unfortunately, this information is not particularly meaningful when it comes to the men of the group, since a considerable portion were doing their military service at the time. This means that our own sample, which deals with choice over a long period of time - up to 2 1/2 years after graduation - probably gives a more accurate picture of the study choices among the male students.

At this stage it might be wise to recall that students may or may not graduate from the program chosen at their first enrollment. Changes in choice of program within higher education were rather frequent during the 1960's. Studies that have paid special attention to this problem agree on the following major points:

(a) most changes take place in the early stages of study,

(b) the transfers lead from open non-vocational studies to vocationally oriented ones with restricted or highly restricted intake (Gesser. 1968; SCB, 1975; Elgqvist-Salzman, 1976).

The shift to programs with restricted intake presumably became less frequent during the period under study here, since the opportunity to improve one's qualifications by studies at the open faculties ceased in 1971.

6.3 Studies in Law and Economics versus Humanities and Social Sciences

6.3.1 Criterion Groups

In the analyses reported in this section students have been divided into two categories, those enrolled in prestige education and those enrolled in other forms of higher education. Due to the low number of women enrolled in prestige education, the analysis had to be limited to men.

On the basis of enrollment data for the period 1956-68, Gesser (1971) concluded that law schools often represented a substitute for restricted intake studies, especially for low-achieving graduates from the upper and upper middle classes. This also seemed to be true of the unrestricted courses in economics/business administration. In the analysis in this section we have assigned these types of studies to the prestige group. According to Gesser (1971), psychology should also be included in the prestige category, but in view of the over-production of psychologists in the late 1960's and the early 1970's, we find this questionable. The very few

psychology students in our sample have not been included in the prestige category. Furthermore, economists and lawyers constituted the two professional categories which, with the exception of doctors, showed the largest expected life incomes (Magnusson and Tychsen, 1972). The expected total life income for other social science graduates, natural science and humanities graduates was considerably lower.

Gesser and Fasth (1973), in their analysis of the relationship between values and vocational choice conducted on a group of gymnasium graduates in 1971, obtained results which point to clear differences between administrative/economic professions and teaching/cultural professions. Students in the first category attached great importance to having a secure future and earning money ("security") as well as aspiring to a position of leadership or a good social position ("influence/power"). Among the students who chose a teaching profession, a desire to work with people ("contact") and an interest in creative activities ("interest") were stressed. Duru (1978) claims to have found by means of interviews of lycée graduates in the Dijon area of France that for persons with a humanistic and social science background who were about to continue on to a traditional general university education within the same field, the factor "present intellectual satisfaction" played a great role (op.cit. 1978 p. 218). Students who intended to study law and/or economics expressed hopes that further studies would ensure more favourable labor market prospects and higher financial gain. The future economists/lawyers were characterized perhaps even more by the fact that they rejected the alternative of university studies in the humanities and social science. These subjects were regarded as too "traditional" in both content and form, and were considered to be poorly suited to the socio-economic realities of today.

The first group of university students included in the analyses in this chapter are thus those enrolled in the Faculty of Law and those in the Faculty of Social science who have chosen one of the subjects included in an economics degree. In the other group are students who have chosen another subject within the "unrestricted" Faculties of Humanities or Social sciences. Ninety-five per cent of all the gymnasium students in the investigated group had a Grade Point Average above the minimum level required for studies at universities and colleges. Thus, practically all were qualified for both law, economics/business administration and other social science studies.

To begin with, only males from the two academically-oriented gymnasium tracks in the non-science sector will be included, i.e., males of the Humanities

and Social Sciences tracks. Subsequent to this, the effect of adding students from the Economic track will be examined. The three gymnasium tracks mentioned supplied approximately 80 per cent of law students, 65 per cent of economics students, 55 per cent of those enrolled in other social science courses and over 75 per cent of the students of the humanities. The rest of the sample came almost exclusively from the Science track. In the prestige category, the ratio between students in economics - business administration and law is 2 to 1. If the gymnasium graduates from the Economic track are excluded from the analysis, the ratio is almost reversed. On the basis of the patterns emerging from previous studies, one would expect that in comparison with students in other social sciences and in the humanities, the law and economics students would be high in Ambition (studying for instrumental purposes) and that the reverse would be true as regards the intrinsic learning aspect, Reading for Pleasure.

The results ought to be interpreted with caution, since the number of individuals in the sub-groups is relatively small.

6.3.2 Results of the MCA

In our analyses of ongoers versus non-ongoers (Chapter 5) we found that the males in the arts and science fields who had continued had done so because both their grades and their levels of ambition were higher than those of the other gymnasium students, but also because they, far more than their classmates, attached an intrinsic value to education. In Table 6.2 below the results of the first analysis are presented. In this analysis those who went on to university were compared with those who did not, the university students being divided into a law/economics group and a humanities and social science group.

From column 1 it can be seen that it is the intrinsic interest aspect which separates the humanities and social science students from classmates who did not go to university. (The comparison concerns only gymnasium graduates from the Humanities and Social Science tracks). Differences in Grades and SES evidently did not play a role. In contrast to this, the influence of Ambition was significant when choosing to undertake studies in law or economics/business administration. However, differences in intrinsic interest were also noticeable. The outcomes of a separate analysis of male students from the Economics track (column 3) are even clearer. A high level of Ambition and Grades appears to be a strongly differentiating factor between the university enrolled, practically all of whom were found in economics and business administration, and the non-ongoers. The variance explained (34 per cent) is relatively high here.

Table 6.2 MCA Summary: Choice of Humanities and Social Sciences Studies instead of Law and Economics/Business Administration

	Humanities & Social Sciences Fac. (1) vs. Non-Ongoing (0) (Graduates of Hum. & Soc. Sci. Tracks)	Law & Economics/ Business Administration (1) vs. Non-Ongoing (0) (Graduates of Hum. & Social Sciences Tracks)	Economics/Business Administration (1) vs. Non-Ongoing (0) (Graduates of Economics Track)	Law & Economics/ Business Admin. (1) vs. Humanities & Social Sciences Fac. (0) (Graduates of Hum., Soc. Sci. & Economics Tracks)	Law & Economics/ Business Admin. (1) vs. Humanities & Social Sciences Fac. (0) (Graduates of Hum. & Soc. Sci. Tracks)
R (adjusted)	.32	.43	.58	.31	.21
R^2 (adjusted)	.10	.18	.34	.10	.05
Eta Coefficients					
SES	.07	.17	.06	-.05	.11
Parental Encouragement	.08	.16	-.15	-.09	.13
Grades	.13	.25	.32	.17	.12
Reading for Pleasure	.28	.26	.26	-.02	-.08
Ambition	.15	.24	.46	.21	.10
Beta Coefficients					
SES	.08	.17	.07	-.03	.09
Parental Encouragement	.02	.12	-.12	-.13	.10
Grades	.02	.18	.32	.18	.10
Reading for Pleasure	.27	.21	.14	-.04	-.08
Ambition	.14	.23	.40	.23	.08
Grand Mean	0.36	0.36	0.31	0.63	0.49
Sample Size	(109)	(103)	(115)	(120)	(76)

Note: Underlined beta coefficients are significant at the .05 level.

The next phase of the analysis included only those who had chosen to continue to higher education (ongoers). The results suggest that the variables studied do not differentiate between students with the same gymnasium background but who have chosen different fields of study in the university education. The variance explained (column 5) in this case was as low as 5 per cent. It is important here to bear in mind that we are dealing with highly selected and homogeneous groups. It is only by including students who have completed the semi-vocational Economic track that the importance of the level of ambition for choice of "prestige" education becomes evident. However, the total predictive value of the independent variables used is still low.

To summarize, the outcomes of the analyses did not lend consistent support to the hypothesis advanced, even though the results tend to point in the expected direction. In the direct comparison between the two groups of university students, it was only the ambition factor which was clearly significant. To get a more detailed description of the two criterion groups, the reader is referred to the cross tabulations given in Appendix C.1-4.

6.4 Studies in Engineering at Institutes of Technology vs. Studies in Science at Universities

6.4.1 Introduction

Around the mid 1960's, a noticeable decrease took place in enrollment in science and technology in several of the highly industrialized countries, for example the United Kingdom and Sweden. Expressions such as "the swing from science" were coined and many a warning voice was raised that the basis for economic progress and welfare would be threatened if this trend continued (Duckworth and Entwistle, 1974; SÖ, 1975). The present author has attempted in a previous report to mirror the attitudes of students enrolled in the Science and Technology tracks towards the role of science in modern society, using certain items from the IEA study (Mählck, 1975) (cf. Husén and Mattsson, 1978). The results suggested that this group of students generally had what we termed "confidence in science" and that this factor was not related to subsequent choice of education. However, a supplementary analysis showed that the students of the Humanities, Social science and Economic tracks were somewhat less confident than their fellow students. This was also associated with a low interest in science and technology in general. It is possible that the questions which were used to assess "confidence in science" were not specific enough.

It is not useful here to present the results of all of the educational sub-groups studied in the report, since these groups were not very homogeneous. For example, some engineering students at the Institute of Technology, who had been accepted into sections with a low entrance requirement, were grouped with students at the generally unstricted Faculty of Science, while others enrolled in the highly restricted sections were put together with students of medicine, dentistry, veterinary science and so on (the "prestige" courses). In the present study, therefore, these sub-groups have been re-constituted. Our main aim will be to shed light on why a person chooses to be trained at Faculty of Science when he/she is qualified for training as an engineer at an Institute of Technology.

The majority of the students graduating from the Institutes of Technology appear to make their career in industry, and their expected life incomes, calculated on the basis of the situation during the 1960's, were much higher than those of other university trained categories, with the exception of economists (see, for example, Ståhl, 1974). It is clear that those who go to the Institutes of Technology will generally work as engineers, except for those who have chosen architecture and land surveying.

However, much more uncertainty surrounds what a student enrolled at the Faculty of Science will do after completion of his studies. During the 1960's the overwhelming majority of graduates became secondary school teachers (Gesser, 1968). Some remained as teachers and researchers at the universities, and some, for instance students of chemistry and those with training in the area of Computer Science/Informatics and related fields, went into commerce. Other students enrolled in the open admission science faculty may not have envisaged to take a full degree in science subjects.

The analysis concentrates on the choices of male students, since the number of women in the relevant sub-groups of the sample is so low. We have purposely only spoken about male students in spite of our awareness that one of the major features of the "science crisis" is the low number of females recruited, especially among engineers. In recent years, this problem has been dealt with by Berner (1975), among others, and in investigations carried out by the Board of Universities and Colleges (UKÄ) (1975) and the National Board of Education (SÖ) (1975). Kelly (1978), using the IEA data, has analyzed determinants of sex differences in achievement and interest in science in countries with different political systems and levels of development.

6.4.2 Criterion groups

In order to make valid comparison in terms of the actual options students have had, one should compare the choices between unrestricted courses at the Faculty of Science, and studies at the departments of the Institutes of Technology which have a relatively low entrance requirement. It is important to note that the latter are not as homogeneous in their entrance requirements as institutions of higher education generally are. There are sometimes considerable differences between consecutive years, especially between Institutes located in different places.(1) It is evident, for example, that some of the more recently established Institutes of Technology have not yet achieved the status which the Royal Technological Institute in Stockholm has enjoyed for decades. However, as in all the analyses of these data, we have had to assume that the students are mobile. In spite of lower entrance requirements in certain places, studies in engineering at the university level probably still enjoy a certain amount of prestige.

The following departments of the Institutes of Technology have been included in the analysis:

- Electrical engineering
- Mechanical engineering
- Aeronautics
- Civil engineering
- Industrial economics

Students at these departments constituted the majority of those in the sample who enrolled in engineering. A majority of those enrolled at the Science Faculty were also qualified for admission to the low-grade departments of the Institutes of Technology.

The MCA was carried out in two stages. First, the future engineers were compared with students enrolled at the Science faculty, regardless of whether they came from the Science or the Technology track. At the next stage students from the Science track were analyzed separately. The latter analysis is more valid in that the graduates of the Technology track who had continued to higher education were concentrated in the Institutes of Technology and very few were enrolled in courses at the Faculty of Science.

6.4.3 Results of the MCA

In interpreting the results (Table 6.3) one should take into account the relatively small size of these sub-samples. The estimated values may thereby become less stable and significant associations can only be expected excep-

tionally. We shall concentrate here, therefore, on the size of the coefficients to see whether it is possible, on the basis of the coefficients, to draw inferences about general patterns in the two analyses.

This analysis, like the other, suggests that the active interest on the part of the parents in their children's studies does not appear to have had any direct influence on the choice of program in higher education. The strong correlation between SES and educational choice can be seen as an indication that the socioeconomic position of the parents has served as a model for their child's choice. The cross tabulations illustrate this association. The proportion of students from working class homes in the Science Faculty was 33 per cent of all those coming from the Science and Technology tracks in the gymnasium. Within the Institutes of Technology (all departments), their number amounted to 18 per cent. The corresponding figures for males from socioeconomic group I were 21 and 47 per cent respectively (Appendix D.1).

Table 6.3 MCA Summary: Choice of Studies at Institutes of Technology (1) instead of Faculty of Science at Universities (0)

	Male graduates of Technology and Science tracks in gymnasium	Male graduates of Science track in gymnasium
R (adjusted)	.37	.52
R^2 (adjusted)	.14	.27
Eta Coefficients		
SES	.27	.43
Parental Encouragement	.07	.20
Grades	.10	-.02
Reading for Pleasure	-.24	-.29
Ambition	.16	.13
Beta Coefficients		
SES	.23	.41
Parental Encouragement	.03	.13
Grades	.07	-.10
Reading for Pleasure	-.18	-.19
Ambition	.16	.11
Grand Mean	0.54	0.41
Sample Size	(120)	(91)

Note: Underlined beta coefficients are significant at the .05 level.

In addition, the results tend to indicate that the higher the level of ambition of the student and the smaller the interest in intellectual development, the higher the likelihood of his enrolling in engineering. The opposite explanatory pattern would then be valid for students who, though qualified for engineering, have nevertheless chosen to study at a Science Faculty either definitely or temporarily. We are here dealing with sub-groups of students with quite similar qualifications, which accounts for the low predictive value of Grades. The proportion of variance explained in this analysis is very moderate (14 per cent). Interestingly enough, it almost doubles (27 per cent) when the students of the Technology track are eliminated. In column 2 of Table 6.3 we can see that in the analysis of the study choices among the science males, the previously mentioned tendencies have been accentuated. The importance of socioeconomic background is very noticeable in this academically homogeneous group.

6.5 Teacher Training versus Traditional University Studies

6.5.1 Introduction

The follow-up study of a sample of upper secondary school graduates ten months after graduation carried out by the Central Bureau of Statistics (SCB, 1972) conveys an interesting picture of which non-university studies were chosen by students who were qualified for entrance into the (1971) open faculties at the universities. The study clearly shows that studies at teacher training colleges for elementary school teachers, which were outside the university system, constituted a real alternative to the traditional university courses for a large proportion of women graduating from university preparatory tracks at upper secondary school. Apart from teacher training, only training for jobs within the health and welfare sector, nursing in particular, and to some extent secretarial courses attracted students outside the traditional university sector to any great extent.

The general pattern of choice presented in the report is similar to that of the present study in that teacher training is the third most popular post-secondary study program chosen and that the enrollment figures are not far behind those of the Faculties of Humanities and Social Sciences respectively. However, figures did not correspond as well as regards educational background, i.e. track membership at the gymnasium, among those who enrolled at teacher training colleges. The SCB study (1972, pp. 32-33) showed that the largest group came from the Social Science track, followed closely by the Humanities track, while the science group was much smaller than the other two.

The present study showed that the three groups were of approximately the same size: 36 per cent came from the Humanities track, 29 from the Social Science track and 32 per cent from the Science track. In Sweden primary school teachers (grades 1-3) and teachers of grades 4-6 are trained at the same institutions, but the courses differ somewhat in duration and the two categories of teachers are placed at different salary levels. Training of primary school teachers takes 2 1/2 years and training of the latter category of teachers lasts one term longer, i.e. 3 years. What these two courses have in common, and what justifies their being merged in the analyses, is that they represent a shorter and more job-oriented training than studies at the Faculties of Humanities and Science. This implies smaller debts after completed studies, and lower incomes and status as compared to traditional academic professions, although better prospects of getting employment. As in many other countries, being an elementary school teacher in the first three grades has been a typical woman's job in Sweden.

Our data are not specific enough to elucidate more thoroughly the choice between teacher training and courses at university. To get a better insight into what mechanisms and motives might be involved, we shall refer to a Scottish study by Flett et al.(1971). The authors studied educational choice by those they termed "academically able" individuals. They draw a sample from among the most able 25 per cent of 1970 Scottish school-leavers. The most prominent feature of the study is that an attempt has been made to distinguish between educational and job-orientated explanations in the analysis of different choices of education. One education oriented hypothesis advanced by Flett et al. was that it is a case of self-selection at two different levels within the system of education, one academic and one non-academic. Students at Teacher Training Colleges consider university studies intellectually more demanding than college studies and have a lower estimation of their own intellectual capacities. Even if this is not the case, the college student may consider herself lacking in the motivational qualities which she thinks are essential for completing a university education. The authors stress that these hypotheses clearly question the general view that the Teacher Training Colleges and the universities are equivalent parts of a pluralistic system of education differing only in their degree of job-orientation. They should rather be considered as two institutions with different positions within a hierarchy.

As regards the job-orientated hypotheses, Flett et al. (1971) expected girls who have gone on to teacher training colleges to be more oriented towards young people and children in comparison with their peers enrolled at university, to rate higher their ability to control pupils in class, to have a lower expectancy as regards salary, to be inclined towards early marriage, and often to come from lower status families. The findings showed that educational factors were more important than occupational factors in determining college entry. A desire to work with children was on the whole the only occupational value to have any direct influence upon the decision to go to Teacher Training Colleges.

It is of interest to note the conclusion of Flett et al.:

> "... it (the result) supports the view that the colleges of education are used as an avenue of higher education by those girls whose qualifications are predominantly non-scientific, and are below current university standards." (Op.cit., p.30)

According to the authors a plausible explanation to this might be that:

> "... school-girls are encouraged to under-achieve and to specialise in arts subjects because the colleges of education are always available as a form of higher education." (Op.cit., p.35)

6.5.2 Criterion Groups

The university group included students enrolled in the Faculties of Science, Humanities and Social Sciences. From the Faculty of Social Sciences only the two-thirds who were not enrolled in prestige study programs were included. Hence, girls studying economic subjects were excluded from the analysis. The intake to Teacher Training Colleges was restricted. The National Board of Education stated that during the period in question virtually no students with a Grade Point Average (GPA) below 3.5 had been admitted. This minimum has fluctuated somewhat, as certain applicants may have referred to practical experience rather than high grades. In our analysis the limit for qualification was placed at a GPA of 3.0, as inspection of our own material showed that the GPA for several accepted students was between 3.0 and 3.5. This implies that two-thirds of the students in our sample who had enrolled at open admission faculties were qualified for teacher training. Or rather, their achievements were comparable to those obtained by students who had been accepted by colleges of education. (However, in all probability all of these

two-thirds would not have been accepted since, if they had all applied, the required Grade Point Averages would naturally have gone up).

6.5.3 Results of the MCA

The MCA analysis, summarized in Table 6.4 below, shows many similarities between teacher trainees and students enrolled in the Faculties of Arts and Sciences. In the first place, only 7 per cent of the variance was explained. Furthermore, there was no noticeable difference between students from the two groups with regard to social background, ambition, and previous achievement. There was a slight tendency for girls engaged in university studies to have experienced more active interest on the part of their parents.

Table 6.4 MCA Summary: Choice of Studies at Teacher Training Colleges (0) instead of Studies at the Arts and Sciences Faculties (1)

	Female graduates of Humanities, Social Science and Science tracks.
R (adjusted)	.27
R^2 (adjusted)	.07
Eta Coefficients	
SES	.10
Parental Encouragement	.14
Grades	-.02
Reading for Pleasure	.21
Ambition	.06
Beta Coefficients	
SES	.08
Parental Encouragement	.11
Grades	-.04
Reading for Pleasure	.20
Ambition	.08
Grand Mean	0.40
Sample Size	(162)

The most apparent difference, however, concerns reading habits. Future university students read far more in their spare time during their years at gymnasium than do other students. In the terminology used earlier, their interest in intellectual development is more pronounced. Earlier analyses reported in Mählck (1975) showed that the tendency to read literature and periodicals with a science content was the main feature differentiating between girls from the Science track studying at the Faculty of Science and those studying at Teacher Training Colleges.

Female science students in the gymnasium who had chosen a university course outside the field of science differed from students at Teacher Training Colleges in showing greater interest in humanities and social science subjects.

To sum up, in contrast to the situation in Scotland around 1970 as reported by Flett et al.(1971), the analysis of the present Chapter has shown that the recruitment of primary school teachers in Sweden during the same period took place among upper secondary school graduates with roughly the same educational characteristics. In particular, their standards of performance were certainly not below those demonstrated by university entrants. A detailed description of the two criterion groups is given in Appendix E.1-4.

6.6 Summary and Discussion

Students' choice of field of study in higher education showed a consistent pattern. By and large choices made upon completion of studies at the gymnasium correspond to the subject fields taken at the secondary level. However, for science students a complete shift to non-science programs at the university level was not uncommon, whereas the reverse, i.e., changes from the non-science sector to science-oriented programs which would require additional studies, were very few. The stability of the choices undertaken also manifested itself in the analysis of each track separately: the majority of the students from the Humanities track attended courses at the Faculty of Humanities, social science graduates continued in the first place to the corresponding Faculty of Social Sciences, etc. The relatively few male students of the semi-vocational tracks who continued to higher education were not only the most consistent in their choice, but also narrowed down their range of options the most.

The analyses in the present Chapter have focussed on the stratification in higher education. The starting point was the finding by several researchers that different academic degrees lead to considerable differences in income and occupational status, depending on type of studies and area of specialization. Furthermore, students from higher social strata were over-represented in the prestige education courses. During the period 1962 to 1972 there was nevertheless a trend towards greater equalization between strata in both engineering and teacher training, but the change was especially marked in law (SCB, 1976; Svensson, 1979).

Through the analyses reported in the present Chapter, it was shown that in two of the comparisons the influence of social background was insignificant

when influences of other factors were considered. But in the third case, where enrollment in Institutes of Technology instead of in Science Faculties was examined, socioeconomic status on the contrary proved to be the most important variable for prediction of choice of program. It should also be noted that all the criterion groups were fairly homogeneous and that Grades did not play a role in any of the comparisons. In the case of engineering one should keep in mind that only the "low-grade" departments of the Institutes of Technology were included in the analyses. This partly explains why socioeconomic status had such an influence. In other words, the students entering these sections did not belong to the most successful group in the gymnasium. They could not exclude the risk of failure in engineering studies. Although the graduation rates at the Institutes of Technology were comparatively high, less than half of the students completed their studies in the time stipulated, i.e., five years (SCB, 1976, p.70-71).

On the basis of previous research one would expect students from working class homes to opt for the most vocationalized of the two study alternatives presented. As we have seen, this may very well be counterbalanced by the duration of the studies. In addition there is reason to believe that the low admission requirements for these sections are associated with less attractive labor market prospects than those of the high-requirement sections (with the exception of architecture).

There is another interesting indicator in the previously cited study by the Central Bureau of Statistics (SCB, 1976, p.70-71). Students who have graduated from the Institutes of Technology after only five years of study were much more frequently of working-class origin. One might at least partly deduce from this that students from less priviledged homes are more subject to self-selection in applying for studies in engineering than their classmates whose parents had university education. One methodological remark should be added. It is important to note that the statistical model employed does not do justice to the influence of social background in the same way as a path model.

In two of the cases studied, the more professionally oriented program, i.e., law, economics/business administration and engineering were considered the higher or more prestigious choice, the lower being represented by the Faculties of Arts and Science. In both cases the tendency was: the higher the level of Ambition and the lower the time spent on Reading for Pleasure, the higher the likelihood that the student had chosen the more professional and prestigious alternative. In the third case (the only one comprising

female students), studies at the Arts and Science Faculties were treated as the higher alternative when contrasted with enrollment in Teacher Training Colleges. Again, Reading for Pleasure was associated with choice of the less professionally oriented alternative; in addition, arts and science students tended to rate slightly higher in Ambition.

It is well known that many students enrolling in these faculties in Sweden frequently do not intend to complete the full graduation program and that for many years the graduation rates have been and still are far below those reported for the more vocationally oriented courses (for a summary on this, see SCB, 1975). Almost by definition vocationally oriented programs are more highly structured and the compulsory element in terms of attendance at classes and written assignments is more pronounced. Nevertheless, in some subjects in the Arts and Science Faculties - foreign languages and chemistry, for example - the compulsory part is also considerable. Another important aspect in this context concerns the workload associated with different kinds of higher studies. We have not been able to find any data for Sweden on this. Orivel (1976) reports some results from a 1973 survey on a sample of French university students that tend to confirm the picture of studies at the less vocationally oriented programs as involving a lower workload and more time for extra curricular activities.

Note

1. According to the figures published by the Central Admission Agency of the Board of Universities and Colleges in 1970, 1971 and 1972, the entrance requirements fluctuated considerably during the five terms covered by this investigation, i.e., 1970-1972. After two terms following graduation ation, when a large portion of the men were doing their military service, the entrance requirements were lowered in practically all cases. The departments included in the analysis had in common the fact that the entrance requirements never came very close to those of the high-grade sections. The highest grade values varied between 3.5 and 3.8. The lowering of requirements which occurred at several departments during the latter part of the period under study meant that the last individual accepted had entered on the basis of a grade point average of 2.3 and 2.4, i.e., at this point admission was, in reality, unrestricted. This being so, we have considered it appropriate to set the lower limit of qualifications for a low-grade department of an Institute of Technology at 2.6, which is the lowest value of any student in the sample who was enrolled in engineering.

CHAPTER 7

SUMMARY AND DISCUSSION OF FINDINGS

7.1 The Choice Situations and the Model Employed

The present investigation has focussed on choice of studies at Swedish universities and colleges. It is based on follow-up data for a nationally representative sample of Swedish students who in 1970 graduated from upper secondary school (gymnasium)(Chapter 4). Models advanced to explain choice of post-secondary studies have been discussed in Chapter 3. The analytical model chosen for the analyses consists of three sets of factors which are likely to affect student choice:

- Socioeconomic Status of the home and Parental Encouragement;
- previous choices and achievements in formal education having brought the student to the current point of decision-making; and
- student aspiration and interest.

The strategy employed in the analyses was that of studying progressively specialized alternatives or programs among increasingly homogeneous groups in terms of previous educational experience. The first and broadest study alternative concerned the general decision to enroll or not to enroll in higher education. Secondly, within the higher education framework the following three alternatives were examined:

- studies in Law, Economics and Business Administration versus enrollment in Humanities and Social Sciences;
- studies at Institutes of Technology (engineering) versus Studies in Science at the university; and
- studies at Teacher Training Colleges versus studies in the Humanities, Social Sciences, or Sciences at the university (i.e., studies at "open admission" faculties).

In our analyses special attention was paid to differences between the graduates in real choice opportunity. Such differences were related to whether the gymnasium graduates

- had studied Science;
- had taken an academic or vocationally oriented program in the gymnasium; or
- had a Grade Point Average that qualified for admission to a program with a restricted intake (numerus clausus).

In view of the characteristics of the initial data set, Multiple Classification Analysis (MCA) was considered to be the appropriate statistical model.

7.2 Main Findings

7.2.1 Choice Related to Background Variables

In the early 1970's female students represented roughly 40 per cent of the total enrollment in traditional university education. If we consider all post-secondary programs, female graduates, according to follow-up studies undertaken by the Central Bureau of Statistics (SCB, 1972, 1976, 1979), more frequently pursue post-secondary studies than do their male counterparts. Women are in the majority in shorter and more vocationalized courses, such as primary teacher training and nursing. Although the universities in general and the branches traditionally chosen by female students, i.e., the Humanities and Social Sciences, have in particular seen a stagnation or even a reduction in female enrollment, more promising trends are also discernible. Women's share in some of the most prestigious fields of study, such as Medicine, Dentistry and Law has increased. In fact, among the students born in 1953 who enrolled in Medicine in the early 1970's, half were women (Svensson,1979).

Large sex differences in educational and occupational choice have been convincingly demonstrated in previous research. We therefore did not include Sex as a variable in our model of analysis, but instead compared predictor patterns for males and females. However, in order to obtain a general point of reference, we estimated at the outset the relative importance of Grades, Socioeconomic Status, and Sex. It was found that the direct influence on the decision to enroll exerted by Socioeconomic Status (SES) of parents and student's Sex in both cases, was significant and of the same magnitude, although far less powerful than that of Grades.

Our analysis of transition rates to higher education among students from various social strata clearly indicated that graduates from the highest socio-economic stratum still improved their relative position, that those of middle class background on the whole maintained their share, while the proportion of graduates of working class origin further declined. The largest difference was found among female graduates. The results of the Multiple Classification Analysis (MCA) showed that the inclusion of Grades in the analyses substantially lowered the association between SES and Ongoing among female graduates. Program consisted of academically oriented gymnasium tracks (Humanities, Social Sciences, Sciences) and semi-vocational ones (Economics and Technology). Introducing Program into the analysis gave important sex differences. For male graduates it meant the disappearance of the direct influence of SES on enrollment in higher education. Program also displayed a significant and independent effect on attendance among females, though considerably less important than among males, and the effect of SES on the criterion remained almost the same.

The simple correlations indicated a positive and significant relation between the student's perception of parental encouragement and enrollment in higher education. This association disappeared when other predictor variables were held under control.

During the 1960's and the early 1970's, the social structure of enrollment in Law, Engineering and Teacher Training became more balanced. Girls from upper class homes appear to have found teacher training an attractive alternative to traditional academic programs (SCB, 1976; Svensson, 1979). These trends are reflected in our findings. It was only in the comparison between student populations in the Institutes of Technology and Faculties of Science that significant differences were found as regards the social composition of the student body. In fact, SES proved to be by far the most important predictor in this case. Some possible reasons for this were advanced and discussed in Chapter 6. In the case of female students, upper class background seems to have facilitated the decision to enter higher education under auspices where a woman would be less frequently expected to continue than a man, for instance, if she had low or only mediocre grades, particularly in combination with graduation from Science track, or had completed a vocational type of program, such as Economics and Business Administration.

7.2.2 Structural Aspects: Previous Choices and Achievement

Grades and secondary school program completed defined the educational experience of the student and structured his/her decision-making vis-à-vis higher education.

In our analysis of what determines enrollment in higher education, Grades and Program were the only two variables that consistently showed a high predictive power. The fact that Grades was the single most powerful predictor of educational choices among all gymnasium graduates could be expected, given the heterogenity of the group. For some students with high grades, several programs with numerus clausus were realistic alternatives, whereas other students were confined to the "open admission" sector. Students who by insufficient grades were excluded from studies with restricted intake consisted of about two-thirds of the total sample. A separate analysis made on this "low-medium" group showed that in spite of its restricted range, Grades also in this case had been a powerful predictor of ongoing, which pointed at the self-selective aspect involved. The predictor patterns for the males were fairly similar to those obtained for the sample as a whole, although, as expected, the relative importance of Program and the attitudinal variables increased when the range of Grades was restricted. As regards the female students, the same operation showed the direct influence of the student's socioeconomic background becoming still more pronounced.

There was a marked discrepancy in the transition rates between graduates of academic and non-academic gymnasium tracks. Furthermore, the effect of Program on ongoing was higher among graduates from the Science sector. The percentage of technology graduates enrolling in higher education was very low. We shall later in the present Chapter comment further upon the role of tracking.

The size of our sample seriously limited the scope of the analysis of choice of post-secondary studies. Only two of the six alternatives singled out for further analysis had a restricted intake. The grades required for admission to these studies were, however, so low that in reality these alternatives also qualified as "open admission" faculties. The results of the MCA confirmed that the past performance of the students enrolled in the various alternatives was very similar and consequently that the influence of Grades on choice was insignificant.

7.2.3 Student Aspiration and Interest

According to the analytical model presented in Chapter 3, Grades were assumed to be closely related to the student's expectations regarding the educational and occupational choice. The variable Ambition was developed to assess the aspirational aspect of educational choice and, in the terminology of Blau et al. (1956), to represent together with Reading for Pleasure the two major factors directly determining student preference for certain educational or occupational alternatives. From a somewhat different point of view, Ambition and Reading for Pleasure could be said to be related to the extrinsic and intrinsic purposes of education respectively.

We found a fairly strong positive association between the attitudinal variables and enrollment in higher education, the size of which was, however, reduced when achievement (Grades) and, in particular, Program were held under control. The contribution of Ambition and Reading for Pleasure to the variance explained, over and above SES, Program, and Grades, was modest in the case of the group taken as a whole. The variance explained increased from 27 to 31 per cent for males, and from 21 to 24 per cent for females. However, in a sub-group, such as male graduates from the Humanities and Social Science track, the introduction of the attitudinal variables resulted in a 40 per cent rise in R^2. As regards prediction of choice between types of higher education, in two of the three analyses undertaken the variance explained was substantially lower than that obtained in the overall analysis of enrollment in higher education. This result is not surprising, since students enrolled in higher education constitute a highly selected group which by our design became still more select.

The results of the MCA showed a consistent pattern. In the first place, graduates who had chosen the least vocationally oriented alternative, i.e., studies in the Arts and Sciences faculties, also displayed the highest intrinsic interest as measured by Reading for Pleasure. Secondly, the higher the level of Ambition the higher the likelihood that the student had chosen the more prestigeous alternative. These results were discussed at some length in the summary of Chapter 6.

7.3 Interpretive Discussion of Findings

7.3.1 Some Conceptual and Methodological Issues

The respective impact of Ambition and Reading for Pleasure appeared to become more complicated when we studied the entire sample of gymnasium students. Students of the semi-vocational tracks spent less time on Reading for Pleasure

than the rest. One would also expect them to show a lower level of aspiration than the students of the academic tracks. However, no significant differences between tracks were found. In addition, within each of these tracks and even more than among the students of academic tracks, Ambition differentiated between those who continued their studies and those who did not continue. These findings seem to indicate that Ambition not only measures level of educational aspiration but instrumental aspects of educational choice as well. Conceptually these phenomena may be close, though not identical, to each other. It would have been desirable to have had other measures to examine their relationship more closely.

In Chapter 3 we discussed the relative importance of instrumental and non-instrumental factors in students' decisions to move from the 9-year comprehensive school to upper secondary school and from the latter to university. We hypothesized that non-instrumental factors and intrinsic interest would be considerably less important in the second case. The difference between the two certainly was found to be smaller than we had expected. Secondly, it had not been expected that the aspirational and/or the instrumental factor would be relatively more important among male graduates studying a humanities or social science curriculum as compared with science and technology graduates.

It is indeed revealing to examine the predictor patterns of different gymnasium tracks with regard to ongoing versus nongoing. Male graduates of the science track have by far the highest grade point average, but it is also among these students that the most variance is found, which explains the high predictive power of Grades. The intercorrelation between Ambition and Grades was higher than that between Ambition and ongoing. In all these aspects, the patterns of the students of Humanities and Social Science tracks were different. The result was that the relative importance of Ambition was higher among the latter students, in spite of the fact that their score on Ambition was lower. These results seriously bring into question the relevance of using variables like Grades and Ambition as competing explanatory factors in a regression type of design when they are based on cross-sectional data, and when their intercorrelations are as high as they were here for the science students. In a situation like this it would be more prudent to consider the two variables as constituting a cluster (see Flett et al., 1971).

Mingat (1977) and Duru (1978) have seriously questioned the use of subjective measures as variables in an explanatory statistical model. The use of measures of the motives for a decision as perceived by the student him-

self and his own interpretation of what factors influenced his choice has often been criticized from a methodological point of view. Härnqvist (1978) concluded that

> "if they (i.e., the perceptions of the students) are measured in a reliable and consistent way and are used to complement more objective methods, they contribute to the comprehension of the choice process as seen from the individual's point of view, and particularly so in the phase that immediately precedes the decision". (Op.cit. 1978, p.22).

The affective variables in the present study are obviously different from those referred to above. They were supposed to serve as proxy measures of some basic values and attitudes likely to explain differences in educational and vocational choice.

According to the model advanced by Blau et al.(1956) student choice of study is a compromise between expectations and preferences for different educational and occupational alternatives. Härnqvist (1978) has pointed out the complexity of the interaction between these two concepts and their immediate determinants, among which previous achievement and aspirations are of particular importance. Thus, one can hardly avoid obtaining relatively high interrelationships between the kinds of determinants mentioned. This is true even when the measures have been developed with the specific aim of studying the process of educational and occupational choice within the framework of a longitudinal design.

7.3.2 Informal or Hidden Selection to Higher Education

Svensson (1979) has analyzed the decline in university enrollment among students straight from the gymnasium that occurred in Sweden between 1969--1975. His conclusion, looking at the overall figures of enrollment in higher education, is that the relative participation of students from lower social strata has diminished. The decline was concentrated to the Faculties of Arts and Sciences. However, the relative position of lower class students is maintained or improved in some of the more attractive and selective institutions, such as Medicine and Dentistry. A comparison of enrollment rates with examination rates indicates an increased gap between upper and lower socioeconomic strata. According to Svensson, this is due to the fact that "young women and men of the higher social strata more frequently choose study programs where the examination rate is high". (Svensson, 1979, p.39 - translated from Swedish by the author). What Svensson refers to here are studies other than those at the "open" faculties. Students in these faculties

where the proportion of students of lower groups is relatively high, to a large extent do not study for a complete degree. However, in looking at each type of study separately, we find little or no difference in attainments between students of different social backgrounds.

This is parallel to what was found at the upper secondary school level in the present study. The differences in the transition rates from gymnasium to higher education that were found between men of high and low status homes could in part be accounted for by their unequal distribution on academic and non-academic tracks. This warrants special attention and should be treated as part of the more general differentiation issue. Research on differentiation taking place after compulsory schooling has focussed on comparisons between on the one hand students enrolled in university preparatory tracks and on the other those in other studies or those who dropped out. Determinants of enrollment for academic or non-academic tracks of the gymnasium have not been systematically explored. Our enrollment data cover the period 1970-1972, that is, after the introduction of the gymnasium reform in 1956. The reform certainly reduced the gap between academic and non-academic tracks, in particular as regards students from the Economic track who in terms of transition rates constitute a third category between the Technology and the academic tracks. However, according to the recent follow-up data (SCB, 1976, 1978), these gaps are still considerable. The aims of the reform of 1965 (SOU,1963) in terms of preparation for university entry among the new category of students are not clearly specified. One gets the impression that the 1960 gymnasium Commission did not expect students of the non-academic track to continue to higher education as frequently as other students.

In response to the question about why students of the non-academic tracks do not continue to higher education as frequently as one might expect, one could ask, as do the authors of the report on selection and certification, (OECD,1977) "why should they?" There is a built-in contradiction in the system, stemming from its dual purpose of preparing students for both further academic studies and direct entry into the labor market. This problem has been labelled "the transfer/terminal dilemma" (OECD, 1977). The authors of the OECD report (1977) see a danger in the new comprehensive upper secondary school in that the requirements of the higher education system exert too great an influence on the orientation of the work of the previously terminal-oriented tracks of the upper secondary school, thus leading to a neglect of the vocational elements and less attention being paid to the specific intrinsic pedagogical objectives of the respective tracks. The change from a terminal- to a transfer-oriented program affects the relationship between formal selec-

tion and self-selection. The report states:

> "While in terminal-oriented streams the educational system was justifiably held responsible for blocking opportunities, the ideology underlying comprehensive types of education tends to stress the individual's responsibility for leaving the system". (OECD, 1977, p.16).

In both the (1977) OECD report and Alexander et al.(1978), two perspectives or modes of interpretation of the position of differentiation beyond post-compulsory education are set forth. These two types of interpretation are referred to as the functionalistic or meritocratic versus the egalitarian or conflict-oriented view. Both imply criticism of how the comprehensive upper secondary school operates, but not of differentiation as such. The problem is not that students of the non-academic streams less frequently go on to higher education, but who these non-academic students are and how they are selected during the process leading up to the terminal year of upper secondary school. In this respect, as Alexander et al. (1978) emphasize, there is no such thing as a perfect meritocracy, nor can we conceive of an ideal equilibrium in the process of track assignment. In our view, the key issue here is the close linkage between the formal selection taking place in the transition from compulsory to upper secondary school and the subsequent informal or hidden streaming taking place during the course of these studies. Both the functionalistic-meritocratic view and the egalitarian-conflict perspective demonstrate this, although their interpretations and suggestions to improve the situation go in opposite directions. We shall use an analogy of the two perspectives as described in Alexander et al. (1978) to shed further light on the difference in university enrollment observed between graduates of academic and non-academic tracks.

A functionalistic view of the reform of the Swedish upper secondary school in 1965, constituting a first step towards a comprehensive one, could be formulated as follows. As was the case before the gymnasium reform, only students with the best scholastic performance are admitted to the academic tracks. This implies that the resources needed to prepare participants to meet the requirements of institutions of higher education are minimized. After the reform, some less able or less motivated students who enrolled in engineering or economics/business administration destined for a career at the middle level, now get access to universities and colleges. A considerable advantage for the students enrolled in these tracks is that, unlike their peers in the academic tracks, they have not embarked upon a course of study that definitely commits them to long and costly studies after the upper

secondary level. In fact, the risk they have taken is minimal. They can wait to make their final decision for another two or three years. At that time they can make their choice from a stronger position, having already completed a course of professional training. During his studies at the gymnasium the student in this category is part of a group whose past performance and interests are similar to his own, and he is more likely to complete his secondary studies free from overly frustrating experiences stemming from competition with academically more able students. Compared to the situation during the last years of the compulsory school, he is likely to develop his potential better. This might lead to improved grades and bring him to envisage further studies, either immediately after graduation or at some later stage. Other students may find themselves in a situation in which their grades jeopardize admission to a professionally oriented course at the university. Given the investment already made, it might in this case be preferable to practise the skills already acquired for some time before taking the final decision instead of enrolling in other studies.

To summarize, even though the major determinant in predicting student enrollment in academic or non-academic tracks is likely to be level of achievement in compulsory school (as in the selection to gymnasium in general), other factors also come into play. This is why students of equal ability or achievement are found in different types of programs. From a meritocratic point of view, this is an inefficient use of human resources and calls for better selection instruments where the motivational aspects are given proper attention.

These concerns are shared, though for different reasons, by the proponents of an egalitarian and/or conflict-oriented approach. For them, it is noteworthy that those who are concerned about the inefficiency of the selection procedure talk so little about the social correlates of this state of affairs. Even in studies where grades, with socioeconomic status of parents held constant, turn out to be the major determinant, one cannot maintain that the entire influence of home background has been accounted for, in particular not the support and encouragement that has been given to the child before the age of 13 or 14, when the informal differentiation mechanisms begin to work (Svensson, 1977). The privileged socioeconomic groups can make better use of the informal differentiation processes of the system at an age where the children are not mature enough to assume responsibility for their own destiny. For many students enrolled in the non-academic tracks, the actual placement corresponds to their second-best choice only. The grade

point average required for entrance to these tracks is the lowest, and this also corresponds to the lowest rank in prestige. This constitutes the beginning of an informal streaming among students who are officially labelled equally qualified candidates for higher education. It is highly unlikely that the students of the non-academic tracks will experience the same challenging intellectual climate as other gymnasium students. Teachers will probably expect less from them and by that token not encourage them to utilize their potential fully. There is in any case no evidence that more has been done to stimulate these new categories of potential university students who started at a lower level of achievement at the entrance to the gymnasium. The same ranking between tracks is found when the students leave the gymnasium.

An interesting example of relative under-achievement during the studies at the gymnasium has been presented by Carlsten et al. (1972). When comparing the five gymnasium tracks, it was found that students enrolled in the Technology track had the second highest mean intelligence score, assessed just before entering gymnasium. Three years later, in the terminal class, their grade point average was the lowest of all gymnasium tracks. The difference we have found in transition rates to higher education are, therefore, not surprising. It seems, then, that there is a sort of determinism in the sense that once the allocation to the university preparatory tracks is made, transfer from one track to another is more or less blocked. This selection sets off the self-selection process which takes on a very different appearance indeed for students of the academic tracks and of higher social strata.

The informal streaming described above within the comprehensive cycle of upper secondary studies is of interest beyond the specific cases studied. Our conclusion can be applied to the present gymnasium system which is almost completely comprehensive. Unless active measures are taken, there is no reason to expect higher university attendance among those who belong to the groups that recently have been admitted (students of the two-year vocational streams of upper secondary schools).

7.4 Investment versus Consumption in Higher Education

When examining choice of type of higher education, we tried to interpret the students' preferences in terms of what have been called instrumental and expressive motives (intellectual development). These are concepts primarily used by sociologists. An alternative interpretation would be to apply the two basic concepts in economic theory: investment and consumption. Orivel (1976) has developed a framework for analyzing educational decisions, in

particular with respect to choice of higher education. According to him (p.107) higher education studies vary in terms of the type and degree of utility they offer to the individual. They could offer:

- present pecuniary resources (fellowships, financial help from family);
- leisure time, different from that in working life;
- immediate intellectual and cultural satisfaction (internal utility);
- a culture and a general knowledge that the individual utilizes throughout life;
- external satisfactions in social and working life (differences in use of leisure time, social status and prestige);
- earnings after completion of studies.

Only differences in time in this definition separate investment from consumption. The first three benefits could be subnamed under "present utilities", i.e., consumption, and the remaining under "future utilities", i.e., investments. To what extent then can the expressive aspects qualify as consumption? To our mind, consumption in Orivel's classification scheme covers a broad range of motives among those who attend some type of higher education, such as genuine interest in a special field of education, interest in cultural and intellectual matters in general (positive or attractive choices); not wanting to enter the labor market at present (negative choices), or not knowing exactly what type of future career to pursue (undecided, "late bloomers", intermittent choices).

According to Orivel's scheme, the internal utility of enrolling in higher education could be both present (consumption) and related to the future (investment). One could imagine a situation where the immediate intellectual and cultural satisfaction of attending a certain type of higher education is low (due to an exessive amount of work required, time pressure etc.), whereas once the studies are finished, the knowledge, insight and intellectual capacity can be a source of lifelong satisfaction. From this point of view, it is obvious that the indicator of the non-instrumental

value of education used in the present study - Reading for Pleasure - is not sufficient in itself to distinguish between consumption and investment. Neither is there a perfect correspondence between instrumental and investment motives. The variable used in our study, Ambition, might be associated with all three aspects of investment mentioned, being related to a lesser extent perhaps to internal, non-pecuniary utility (i.e., acquisition through higher studies of a general culture and knowledge to be utilized throughout life) than to external usefulness (differences in leisure activities, social status and prestige) and the additional monetary gain aspect. It is likely that differences in the tendency to "consume" education correspond to differences in pragmatic orientation. Here it becomes evident that the variables of the present study give an incomplete picture of the factors influencing educational choice. Rejection of the long, traditional types of university education, in combination with a desire to invest in a form of education which yields a faster and more tangible return, also characterized students who chose a shorter and more vocationally geared education in Duru's (1978) study.

Let us now examine how Orivel tested his model empirically. Even though the data available probably influenced the way Orivel tested his model, he seems to have put the major emphasis on two of the consumption components, namely spare time (the converse of work load) and material resources available for different types of studies, and how these relate to one of the investment components, namely the estimated future monetary benefits. As expected, the results indicated a negative association. One might infer from the logic of his approach that preferences for intellectual and cultural as well as political activities are strongly associated with preferences for studies that really make it possible to exercise these activities. The basic assumption is that since there is a limited amount of time available, every activity that is not investment constitutes consumption. Time on consumption, then, is always spent at the expense of investment.

A ranking of faculties in terms of the investment and consumption aspects indicates that the scheme presented by Orivel is of interest to the present study. The author (1976, p.113) characterizes the faculties in the following way:

(1) Students in medicine invest heavily: their future benefits are much superior to those of other students, but on the other hand during their studies they have lower resources and less leisure time than other students.

(2) Students of law and economics invest less and consume more, both in terms of leisure time and money.

(3) Students in Humanities and Science Faculties are those who invest the least and consume the most. They differ from each other in the sense that students in the humanities prefer leisure time to money, whereas the students of science tend to make the opposite choice.

What type of relationship could be expected between the consumption and investment aspects if intellectual and cultural activities constituted the investment component? In theory, at least, it should be possible to ask students to distinguish between immediate and long term intellectual activities associated with different educational alternatives. Apparently, students enrolled in studies characterized by a relatively low rate of return and a high amount of leisure time, and who subsequently tend to spend more time on intellectual/cultural activities, could also be expected to rank high on importance given to life-long intellectual/cultural aspects. The reverse pattern would emerge among students whose future occupation will bring them much money and social prestige. It should be noted that we are here speaking relatively and comparing study alternatives in very broad terms.

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At the time when the expansion of enrollment in Swedish higher education was reaching its peak, new trends in admission policies emerged. Continued expansion at the same rate would be too costly. Both public opinion and the policy makers were becoming increasingly aware that general expansion did not provide any guarantee of the disappearance of the existing inequalities between men and women, between social classes or between generations. Criteria other than the meritocratic ones for admission to higher education gradually gained acceptance. For the new comprehensive organization of Swedish post-secondary education which became effective in 1977, a fully-fledged quota system has been developed. In addition to educational attainments, work experience is being used as one selection criterion. Special admittance criteria are used for certain types of courses. A project

designed to evaluate the effects of the new admission procedures has been launched and the first report on the effects of the reform on age structure and social composition of enrollment, has recently been published (Kim, 1979).

APPENDIX A.

Table A.1 Students' Grade Point Averages at Graduation from Gymnasium by Track and Socioeconomic Background. Males.

SES	All			SES III Low			SES II			SES I High		
TRACK	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n
Humanities	3.41	0.75	32	3.32	0.78	6	3.68	0.68	10	3.28	0.78	16
Social Sciences	3.08	0.61	155	2.98	0.62	39	3.03	0.61	66	3.23	0.57	50
Economic	3.18	0.59	144	3.29	0.58	49	3.13	0.61	64	3.13	0.59	31
Science	3.30	0.75	306	3.05	0.75	71	3.29	0.71	135	3.49	0.77	100
Technology	3.09	0.71	256	3.11	0.76	99	3.09	0.64	105	3.05	0.77	52

Table A.2 Students' Grade Point Averages at Graduation from Gymnasium by Track and Socioeconomic Background. Females.

SES	All			SES III Low			SES II			SES I High		
TRACK	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n
Humanities	3.31	0.65	257	3.28	0.51	66	3.26	0.65	107	3.40	0.75	84
Social Sciences	3.32	0.58	201	3.31	0.54	48	3.26	0.55	109	3.48	0.68	44
Economic	3.13	0.49	148	3.07	0.47	42	3.15	0.52	80	3.17	0.43	26
Science	3.48	0.64	156	3.32	0.58	38	3.43	0.67	75	3.69	0.60	43

Table A.3 Parental Encouragement. Percentages by Sex (Females and Males). Whole Sample.

		Parental Encouragement			
Sex		Never	Sometimes	Often	n
Females	%	26	36	38	881
Males	%	34	38	28	752
Total	%	30	37	33	1633

Table A.4 Reading for Pleasure. Percentages by Sex (Females and Males). Whole Sample.

		Reading for Pleasure			
Sex		Low		High	n
Females	%	11	25	64	890
Males	%	19	25	56	756
Total	%	15	25	60	1646

Table A.5 Ambition. Percentages by Sex (Females and Males). Whole Sample.

		Ambition			
Sex		Low		High	n
Females	%	4	34	62	873
Males	%	7	32	61	747
Total	%	5	33	62	1620

APPENDIX B.

Table B.1 Rates of Transition from Gymnasium to Universities and Colleges by Grades and Track. Males.

TRACK / GRADES	Humanities	Social Sciences	Economic	Science	Tech-nology	Total	n
2.3 - 3.4	62	48	33	49	8	35	187
3.5 - 3.9	75	79	47	83	31	59	88
4.0 - 5.0	56	75	83	96	73	84	124
Total	63	56	41	66	23		399

Table B.2 Rates of Transition from Gymnasium to Universities and Colleges by Grades and Track. Females.

TRACK / GRADES	Humanities	Social Sciences	Economic	Science	Tech-nology	Total	n
2.3 - 3.4	31	30	15	27	-	26	110
3.5 - 3.9	53	46	24	47	-	44	66
4.0 - 5.0	83	83	57	93	-	84	83
Total	45	42	19	47	-		259

Table B.3 Students Enrolled in Higher Education by Socioeconomic Background. Percentages of Females and Males.

SES / SEX	Low SES III	SES II	High SES I	n
Females %	21	43	36	399
Males %	24	42	34	259
Total %	22	43	35	658

Table B.4 Rates of Transition from Gymnasium to Universities and Colleges by Grades and Socioeconomic Background. Males.

SES	GRADES Low 2.3 - 3.4	3.5 - 3.9	High 4.0 - 5.0	Total	n
Low SES III	30	43	82	40	94
SES II	35	67	79	47	169
High SES I	42	66	91	58	136
Total	35	59	84	48	399

Table B.5 Rates of Transition from Gymnasium to Universities and Colleges by Grades and Socioeconomic Background. Females.

SES	GRADES Low 2.3 - 3.4	3.5 - 3.9	High 4.0 - 5.0	Total	n
Low SES III	22	42	79	31	53
SES II	21	42	86	35	112
High SES I	43	50	83	55	94
Total	26	44	84	39	259

Table B.6 Intercorrelations among Predictor Variables.(1) All Males.

VARIABLES	X_1	X_2	X_3	X_4	X_5	X_6
X_1 SES		.188	.120	.072	.011	.035
X_2 Program	827		.168	.051	.097	.022
X_3 Parental Encouragement	815	815		.003	.070	.135
X_4 Grades	827	827	815		.090	.218
X_5 Reading for Pleasure	825	825	814	825		.097
X_6 Ambition	809	809	799	809	825	

(1) Underlined coefficients are statistically significant at the .01 level.

Table B.7 Intercorrelations among Predictor Variables.[1] All Females.

VARIABLES		X_1	X_2	X_3	X_4	X_5	X_6
X_1	SES		.079	.067	.166	.084	.086
X_2	Program	670		.065	.150	.065	.026
X_3	Parental Encouragement	661	661		.038	.156	.156
X_4	Grades	670	670	661		.136	.172
X_5	Reading for Pleasure	665	665	658	665		.071
X_6	Ambition	658	658	650	658	654	

[1] Underlined coefficients are statistically significant at the .01 level.

Table B.8 Intercorrelations among Predictor Variables.[1] Males with Low and Medium Grades.

VARIABLES		X_1	X_2	X_3	X_4	X_5	X_6
X_1	SES			.075	.010	.008	.012
X_2	Program	532		.138	-.024	.045	.021
X_3	Parental Encouragement	525	525		.001	.100	.149
X_4	Grades	532	532	525		.088	.168
X_5	Reading for Pleasure	531	531	525	531		.003
X_6	Ambition	519	519	514	519	519	

[1] Underlined coefficients are statistically significant at the .01 level.

Table B.9 Intercorrelations among Predictor Variables.[1] Females with Low and Medium Grades.

VARIABLES		X_1	X_2	X_3	X_4	X_5	X_6
X_1	SES		.022	.059	.007	.055	.024
X_2	Program	440		.026	.026	.037	.002
X_3	Parental Encouragement	436	436		.023	.178	.157
X_4	Grades	440	440	436		.050	.017
X_5	Reading for Pleasure	436	436	433	436		.063
X_6	Ambition	434	434	431	434	431	

[1] Underlined coefficients are statistically significant at the .01 level.

Table B.10 Rates of Transition from Gymnasium to Universities and Colleges by Parental Encouragement and Reading for Pleasure. All Females. n = 658

	Reading for Pleasure	Low		High
Parental Encouragement		1	2	3
Low	1	28	22	39
	2	11	41	39
High	3	25	31	52

Table B.11 Rates of Transition from Gymnasium to Universities and Colleges by Parental Encouragement and Reading for Pleasure. Females from Humanities, Social Sciences and Economic Tracks. n = 527.

	Reading for Pleasure	Low		High
Parental Encouragement		1	2	3
Low	1	18	18	43
	2	10	38	36
High	3	13	27	50

Table B.12 Rates of Transition from Gymnasium to Universities and Colleges by Parental Encouragement and Reading for Pleasure. Females from Humanities and Social Sciences Tracks. n = 385.

	Reading for Pleasure	Low		High
Parental Encouragement		1	2	3
Low	1	20	21	48
	2	8	61	40
High	3	17	34	57

Table B.13 Rates of Transition from Gymnasium to Universities and Colleges by Socioeconomic Background and Program. All Females. n = 670.

SES	Low		High
Program	III	II	I
Semi-vocational	15	14	42
Academic	35	41	57

Table B.14 MCA Summary for Choice of University or College Attendance (Code 1) versus Non-Attendance (Code 0) Related to Basic Factors.[1]

R (adjusted)	.43	.47	.44	.50
R^2 (adjusted)	.19	.22	.20	.25
Eta Coefficients				
Sex	-	-	.10	.10
SES	.16	.16	.16	.16
Program	-	.25	-	.25
Grades[2] (r)	.42	.42	.42	.42
Beta Coefficients				
Sex	-	-	.11	.17
SES	.11	.09	.11	.08
Program	-	.20	-	.24
Grades	.40	.39	.40	.39
Grand mean	0.44			
Sample size	1497			

[1] All Beta coefficients are significant at the .05 level.

[2] Covariate, r = correlation coefficient.

Table B.15 MCA Summary for Choice of University or College Attendance (Code 1) Versus Non-Attendance (Code 0), Related to Basic Factors with Stepwise Entry of Variables.

	Males				Females			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
R (adjusted)	.44	.52	.48	.56	.45	.46	.47	.49
R^2 (adjusted)	.19	.27	.23	.31	.19	.21	.22	.24
Eta Coefficients								
SES	.14	.14	.15	.15	.20	.20	.20	.20
Program	-	.32	-	.34	-	.21	-	.22
Parental Encouragement	-	-	.11	.11	-	-	.12	.12
Grades	.42	.42	.42	.42	.42	.42	.42	.42
Reading for Pleasure	-	-	.17	.17	-	-	.16	.16
Ambition	-	-	.22	.22	-	-	.17	.17
Beta Coefficients								
SES	.11	.05	.11	.06	.12	.11	.11	.10
Program	-	.29	-	.29	-	.14	-	.14
Parental Encouragement	-	-	.06	.06	-	-	.07	.06
Grades	.32	.31	.29	.36	.33	.31	.32	.36
Reading for Pleasure	-	-	.13	.11	-	-	.09	.08
Ambition	-	-	.13	.13	-	-	.08	.08
Grand Mean	.48	.48	.48	.48	.39	.39	.39	.39
Sample Size	827	827	798	798	670	670	647	647

Note: 1. Underlined beta coefficients are significant at the 0.05 level.

2. For Grades, the figures given under the heading "Beta Coefficients" are actually nonstandardized regression coefficients in columns (1) - (3) and (5) - (7).

APPENDIX C.

Table C.1 Choice of Studies at Faculties of Humanities and Social Sciences versus Law and Economics/Business Administration. Cross-tabulation by Socioeconomic Background. Ongoing Males from Humanities, Social Sciences and Economic Tracks at Gymnasium. n = 127.

n Row % Col. %	Low SES III	 SES II	High SES I	Total
Humanities and Social Sciences	12 25.5 38.7	18 38.3 32.7	17 36.2 41.5	47 37.0
Law and Economics/ Business Administration	19 23.8 61.3	37 46.3 67.3	24 30.0 58.5	80 63.0
Total	24.4	43.3	32.3	100.0

Table C.2 Choice of Studies at Faculties of Humanities and Social Sciences versus Law and Economics/Business Administration. Cross-tabulation by Parental Encouragement. Ongoing Males from Humanities, Social Sciences and Economic Tracks at Gymnasium. n = 125.

n Row % Col. %	Parental Encouragement Never	 Sometimes	 Often	Total
Humanities and Social Sciences	11 23.9 31.4	15 32.6 34.9	20 43.5 42.6	46 36.8
Law and Economics/ Business Administration	24 30.4 68.6	28 35.4 65.1	27 34.2 57.4	79 63.2
Total	28.0	34.4	37.6	100.0

Table C.3 Choice of Studies at Faculties of Humanities and Social Sciences versus Law and Economics/Business Administration. Cross-tabulation by Reading for Pleasure. Ongoing Males from Humanities, Social Sciences and Economic Tracks at Gymnasium. n = 125.

n Row % Col. %	Reading for Pleasure Low		High	Total
Humanities and Social Sciences	2 4.3 33.3	8 17.0 36.4	37 78.7 38.1	47 37.6
Law and Economics/ Business Administration	4 5.1 66.7	14 17.9 63.6	60 76.9 61.9	78 62.4
Total	4.8	17.6	77.6	100.0

Table C.4 Choice of Studies at Faculties of Humanities and Social Sciences versus Law and Economics/Business Administration. Cross-tabulation by Ambition. Ongoing Males from Humanities, Social Sciences and Economic Tracks at Gymnasium. n = 121.

n Row % Col. %	Ambition Low		High	Total
Humanities and Social Sciences	2 4.5 40.0	15 34.1 55.6	27 61.4 30.3	44 36.4
Law and Economics/ Business Administration	3 3.9 60.0	12 15.6 44.4	62 80.5 69.7	77 63.6
Total	4.1	22.3	73.6	100.0

Table C.5 Choice of Studies at Faculties of Humanities and Social Sciences versus Law and Economics/Business Administration. Cross-tabulation by Grades. Ongoing Males from Humanities, Social Sciences and Economic Tracks at Gymnasium. n = 127.

n Row % Col. %	Grades Low 2.3 - 3.4	3.5 - 3.9	High 4.0 - 5.0	Total
Humanities and Social Sciences	35 74.5 42.2	6 12.8 20.0	6 12.8 42.9	47 37.0
Law and Economics/ Business Administration	48 60.0 57.8	24 30.0 80.0	8 10.0 57.1	80 63.0
Total	65.4	23.6	11.0	100.0

APPENDIX D.

Table D.1 Choice of Studies at Faculty of Science versus Institute of Technology. Crosstabulation by Socioeconomic Background. Ongoing Males from Science Track at Gymnasium. n = 92.

n Row % Col. %	Low SES III	 SES II	High SES I	Total
Faculty of Science	18 32.7 94.7	25 45.5 62.5	12 21.8 36.4	55 59.8
Institute of Technology	1 2.7 5.3	15 40.5 37.5	21 56.8 63.6	37 40.2
Total	20.7	43.5	35.9	100.0

Table D.2 Choice of Studies at Faculty of Science versus Institute of Technology. Crosstabulation by Parental Encouragement. Ongoing Males from Science Track at Gymnasium. n = 92.

n Row % Col. %	Parental Encouragement Never	 Sometimes	 Often	Total
Faculty of Science	22 40.0 71.0	20 36.4 50.0	13 23.6 61.9	55 59.8
Institute of Technology	9 24.3 29.0	20 54.1 50.0	8 21.6 38.1	37 40.2
Total	33.7	43.5	22.8	100.0

Table D.3 Choice of Studies at Faculty of Science versus Institute of Technology. Crosstabulation by Reading for Pleasure. Ongoing Males from Science Track at Gymnasium. n = 92.

n Row % Col. %	Reading for Pleasure Low	High	Total
Faculty of Science	5 9.1 31.3	20 36.4 74.1	30 54.5 61.2	55 59.8
Institute of Technology	11 29.7 68.8	7 18.9 25.9	19 51.4 38.8	37 40.2
Total	17.4	29.3	53.3	100.0

Table D.4 Choice of Studies at Faculty of Science versus Institute of Technology. Crosstabulation by Ambition. Ongoing Males from Science Track at Gymnasium. n = 91.

n Row % Col. %	Ambition Low	High	Total
Faculty of Science	2 3.7 100.0	13 24.1 54.2	39 72.2 60.0	54 59.3
Institute of Technology	0 0.0 0.0	11 29.7 45.8	26 70.3 40.0	37 40.7
Total	2.2	26.4	71.4	100.0

APPENDIX E.

Table E.1 Choice of Studies at Faculties of Humanities, Social Sciences and Science versus Teacher Training Colleges. Crosstabulation by Socioeconomic Background. Ongoing Females from Humanities, Social Sciences and Science Tracks at Gymnasium. n = 168.

n Row % Col. %	Low SES III	 SES II	High SES I	Total
Faculties of Humanities, Social Sciences and Science	26 26.0 60.5	45 45.0 56.3	29 29.0 64.4	100 59.5
Teacher Training Colleges	17 25.0 39.5	35 51.5 43.8	16 23.5 35.6	68 40.5
Total	25.6	47.6	26.8	100.0

Table E.2 Choice of Studies at Faculties of Humanities, Social Sciences and Science versus Teacher Training Colleges. Crosstabulation by Parental Encouragement. Ongoing Females from Humanities, Social Sciences and Science Tracks at Gymnasium. n = 165.

n Row % Col. %	Parental Encouragement Never	 Sometimes	 Often	Total
Faculties of Humanities, Social Sciences and Science	21 21.4 47.7	31 31.6 60.8	46 46.9 65.7	98 59.4
Teacher Training Colleges	23 34.3 52.3	20 29.9 39.2	24 35.8 34.3	67 40.6
Total	26.7	30.9	42.4	100.0

Table E.3 Choice of Studies at Faculties of Humanities, Social Sciences and Science versus Teacher Training Colleges. Crosstabulation by Reading for Pleasure. Ongoing Females from Humanities, Social Sciences and Science at Gymnasium. n = 166.

n Row % Col. %	Reading for Pleasure Low		High	Total
Faculties of Humanities, Social Sciences and Science	6 6.1 33.3	18 18.2 51.4	75 75.8 66.4	99 59.6
Teacher Training Colleges	12 17.9 66.7	17 25.4 48.6	38 56.7 33.6	67 40.4
Total	10.8	21.1	68.1	100.0

Table E.4 Choice of Studies at Faculties of Humanities, Social Sciences and Science versus Teacher Training Colleges. Crosstabulation by Ambition. Ongoing Females from Humanities, Social Sciences and Science Tracks at Gymnasium. n = 164.

n Row % Col. %	Ambition Low		High	Total
Faculties of Humanities, Social Sciences and Science	2 2.0 66.7	27 27.6 56.3	69 70.4 61.1	98 59.8
Teacher Training Colleges	1 1.5 33.3	21 31.8 43.8	44 66.7 38.9	66 40.2
Total	1.8	29.3	68.9	100.0

Table E.5 Choice of Studies at Faculties of Humanities, Social Sciences and Science versus Teacher Training Colleges. Crosstabulation by Grades. Ongoing Females from Humanities, Social Sciences and Science Tracks at Gymnasium. n = 168.

n Row % Col. %	Grades Low 2.3 - 3.4	3.5 - 3.9	High 4.0 - 5.0	Total
Faculties of Humanities, Social Sciences and Science	39 39.0 72.2	31 31.0 43.1	30 30.0 71.4	100 59.5
Teacher Training Colleges	15 22.1 27.8	41 60.3 56.9	12 17.6 28.6	68 40.5
Total	32.1	42.9	25.0	100.0

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